Paradise Creek Ecosystem Restoration Project

Section 206

Environmental Assessment

Moscow, Idaho

Prepared by the
U.S. Army Corps of Engineers
Walla Walla District

June 2006

DRAFT[*]

FINDING OF NO SIGNIFICANT IMPACT

PARADISE CREEK ECOSYSTEM RESTORATION PROJECT
MOSCOW, IDAHO

The U.S. Army Corps of Engineers and the University of Idaho are conducting a Feasibility Study of aquatic ecosystem restoration and environmental enhancements on a section of Paradise Creek in Moscow, Idaho. The Feasibility Study is being conducted in accordance with Section 206 of the Water Resource Development Act of 1996, which authorizes the Corps to undertake aquatic ecosystem restoration projects in the public interest. The University of Idaho is the non-federal sponsor for this ecosystem restoration project. The City of Moscow is also very supportive of this effort. The city has signed a letter of understanding with the University that verifies the commitments between the two parties.

As required by the National Environmental Policy Act of 1969 and subsequent implementing regulations promulgated by the Council on Environmental Quality, this Environmental Assessment (EA) was prepared in order to determine whether the proposed action constitutes a "…major Federal action significantly affecting the quality of the human environment…" and whether an environmental impact statement is required. This EA documents the evaluation and consideration of environmental effects throughout the study and planning process for the restoration and enhancement of Paradise Creek. Based upon the project purpose and objectives, alternative concepts for habitat enhancements were developed and evaluated.

This project encompasses the restoration and rehabilitation of certain reaches of Paradise Creek located on the campus of the University of Idaho in Moscow, Idaho. Some of the benefits of this project include aquatic and riparian habitat improvements, enhanced environmental sustainability, improved flood control, storm water quality improvements, and enhanced research opportunities in the area of storm water mitigation and bioremediation.

Several alternatives for environmental improvements to Paradise Creek were developed and analyzed. The preferred alternative relocates a portion of Paradise Creek as it exists today, moving it from a trapezoidal, riprap-lined, concrete covered channel and restoring the creek to an open channel approximating the creek's historical channel alignment. Additionally, habitat improvements on upstream and downstream sections of the creek and construction of storm water wetland cells are recommended to be included as part of the preferred alternative. Implementation of all of the separate areas is dependent on funding and obtaining the necessary real estate instruments to construct the project. Funding priority will be given first to relocate the channel and make habitat improvements on the new channel.

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[*] This DRAFT FONSI has been prepared to reflect the Feasibility Study analysis to date. Additional information may be obtained during public review that will be included in the final decision on the applicability of a FONSI.

Other alternatives considered included uncovering and improving Paradise Creek in the existing covered channel, creating a new channel within an existing overflow swale, as well as taking no action at all.

The project was coordinated with the U.S. Fish and Wildlife Service, the Idaho Department of Environmental Quality, the Idaho Department of Fish and Game, the Idaho State Historic Preservation Office, the Nez Perce Tribe, and the public. A concurrence letter on our determination, "no effect on historic properties", was received from the Historic Preservation Office on November 24, 2003. The Idaho Department of Environmental Quality issued 401 Certification under the Clean Water Act on (Insert Date when received). The project is in compliance with all applicable laws and regulations.

(A summary of public comments, agency comments, and our responses will be included here.)

In view of the information provided by these sources and the environmental assessment, I find that the proposed action would not significantly affect the quality of the human environment; therefore, an environmental impact statement is not required.

Date:_____

Insert appropriate name here
Lieutenant Colonel, Corps of Engineers
District Engineer

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FOREWORD

As required by the National Environmental Policy Act of 1969 and subsequent implementing regulations promulgated by the Council on Environmental Quality, this Environmental Assessment has been prepared to determine whether the action proposed by the U.S. Army Corps of Engineers and the University of Idaho constitutes a "…major Federal action significantly affecting the quality of the human environment…" and whether an environmental impact statement is required. This assessment documents the evaluation and consideration of environmental effects throughout the study and planning process for the restoration and enhancement of the creek and surrounding area. Based on the project purpose and objectives, alternative concepts for creek alignment and habitat enhancements were developed and evaluated.

Section 1 of the document presents the general background of the project, the purpose of the project, and the authority under which the project is being carried out. This information facilitates the development of alternatives that are documented in Section 2 and provides the basis for much of the environmental and socio-economic analysis in Section 3.

Section 2 presents a general description of the project area, the alternatives that were developed and reviewed, and which alternatives were removed from further consideration. This section also presents brief summaries of potential impacts of each alternative. The environmental and socio-economic effects of the alternatives that were determined to be reasonable in fulfilling the project purpose were evaluated in detail in Section 3.

Section 3 discusses the existing environmental conditions in the project study area and the anticipated effects that would occur for each alternative. In addition, the "No Action" alternative is evaluated, which provides a comparison to the other alternatives. The descriptions of the biological, physical, cultural, and socio-economic resources serve as a basis for evaluation and comparison of the anticipated effects of the alternatives.

Section 4 identifies the legal, policy, and regulatory requirements that could affect each of the proposed alternatives. The implications for each of those requirements are discussed with respect to the proposed alternatives.

Section 5 presents the results of discussions with the agencies having regulatory responsibility or who manage the natural resources within the project area; and Section 6 lists the references cited within the document.

The Appendices contain supporting documentation, including letters from the project sponsor, a letter of concurrence from the State Historic Preservation Office, and notes from a public meeting.

SECTION 1 – INTRODUCTION

The U.S. Army Corps of Engineers (Corps) and the University of Idaho are conducting a Feasibility Study of aquatic ecosystem restoration on a section of Paradise Creek in Moscow, Idaho. The Feasibility Study is being conducted in accordance with Section 206 of the Water Resource Development Act of 1996, which authorizes the Corps to undertake aquatic ecosystem restoration projects in the public interest. The University of Idaho is the non-federal sponsor for this project. The City of Moscow is also very supportive of this effort. The city has signed a letter of understanding with the University that verifies the commitments between the two parties (in Appendix A).

This Environmental Assessment (EA) considers potential impacts from both construction and operation of the proposed project. For the purposes of this EA, the project study area includes a corridor along Paradise Creek from Highway 95 to Perimeter Drive. The potential channel relocation area just south of State Route 8 is also included. The proposed project is located in Township 39 North, Range 5 West, Sections 7, 12, and 18, Latah County, Idaho (Project Vicinity Map, Pg. 44). The proposed project would include work by the Corps for the University of Idaho.

Key considerations of this study include opportunities to:

- Daylight (uncovering and opening to the environment) about 1,100 feet of Paradise Creek that is currently a covered channel.
- Establish a riparian vegetation corridor along the new Paradise Creek channel.
- Daylight a portion of Hog Creek (a tributary to Paradise Creek).
- Improve water quality in Paradise Creek.
- Improve the aesthetics in the area.

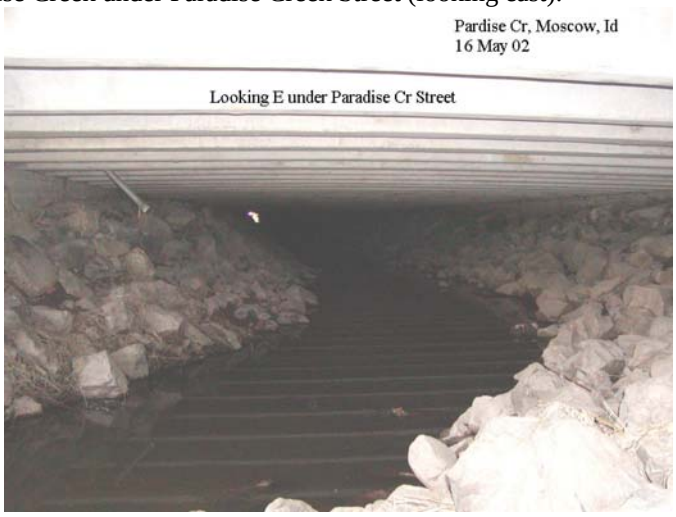
1.1 Background

Paradise Creek originates on Moscow Mountain (elev. 4,356 ft.), then flows in a southwesterly direction for 20 miles, through Moscow, Idaho (elev. 2,520 ft.), ultimately to enter the South Fork of the Palouse River in Pullman, Washington. Paradise Creek drains 34 square miles. Much of the stream flows through agricultural fields. Wetlands associated with riparian areas along Paradise Creek are in poor condition due to past and present management activities such as draining and tiling.

In the early 1900s, a section of Paradise Creek in Moscow was rerouted. In addition to relocating the creek, an 1,100 foot section of the creek was covered in the 1960s. The existing creek alignment enters a trapezoidal, riprap-lined, concrete covered channel immediately east of Line Street and continues in a fully enclosed channel for approximately 1,100 feet before day-lighting west of Rayburn Street. Photo 1-1 shows the current alignment of Paradise Creek, flowing directly under Paradise Creek Street. Photo 1-2 shows the covered creek.

Photo 1-1. Paradise Creek Street (looking west). The overflow swale is located to the right of the sidewalk and street lamps.

Photo 1-2. Paradise Creek under Paradise Creek Street (looking east).



1.2 Project Purpose

The purpose of the Paradise Creek Ecosystem Restoration Project is to restore a highly degraded section of Paradise Creek in the Moscow, Idaho area. Adjacent areas of the creek that are not as badly degraded may also be considered in addition to the highly degraded section. Restoration would be accomplished by creating a healthy, diverse, and sustainable stream condition in Paradise Creek around the University of Idaho campus. Restoration would improve in-stream habitat, rebuild a continuous habitat corridor and improve wildlife habitat along the identified sections of Paradise Creek. Some of the other benefits of this project include enhanced

environmental sustainability, storm water quality improvements, and improved flood damage reduction.

1.3 Authority

Section 206 of the Water Resources Development Act (WRDA) 1996 authorizes the Corps of Engineers to carry out projects for aquatic ecosystem restoration and protection if it is determined that the project will improve the quality of the environment, is in the public interest, and is cost-effective. Not more than $5 million in Federal funds may be spent on a single project. The entire program is limited to $25 million in appropriations in a fiscal year. A non-Federal interest must provide 35 percent of the project cost including all lands, easements, rights-of-way, relocations, and disposal areas (LERRDs) as well as 100 percent of all operation and maintenance costs.

SECTION 2 - Alternatives

This section presents a general description of the project area, the alternatives that were developed, and which alternatives were removed from further consideration. Brief summaries of potential impacts of each alternative are discussed. The preferred alternative is also presented. A more detailed discussion of impacts is presented in Section 3.

2.1 General Description of the Study Area

Moscow is located in the Idaho panhandle along the border with Washington State. Moscow's population of around 25,000 is bolstered by the presence of the University of Idaho. Moscow has a four-season climate with winter being the wettest time of the year. Precipitation over the basin averages 23 inches with an average snowfall of about 48 inches. The topography in the Paradise Creek watershed ranges from steep mountains in the headwaters to broad, rounded, rolling, high prairies in the lower parts of the basin. Elevations range from 2,360 feet at Pullman, WA to 4,500 feet at the headwaters of Paradise Creek. Paradise Creek drains a basin of 17.70 square miles above the University of Idaho at Moscow. Flows in Paradise Creek are extremely variable, averaging less than one cubic foot per second (cfs) from July through October, while peaking in excess of 400 cfs during spring runoff (U.S. Fish and Wildlife Service 1989). Flow frequencies are presented in Table 2-1. The creek was identified as water quality limited from its headwaters to the Washington State line in 1994 for several pollutants. During high flows, the creek typically carries a large suspended sediment load and woody debris.

Table 2-1. Approximate flow frequencies for Paradise Creek at the University of Idaho at Moscow, Idaho (below Hog Creek).

Percent Exceedance	Paradise Creek (drainage area 17.7 mi^2)
50	340 cfs
20	515 cfs
10	660 cfs
4	885 cfs
2	1,090 cfs
1	1,310 cfs

Within the covered portion of the channel, 20 storm water collection pipes discharge directly into the creek carrying untreated runoff and spring water from about 126 acres of the University of Idaho campus. Just north of the creek (in the right side of photo 1-1), the University has constructed a 40-foot wide swale to carry flood flows.

Though the creek once supported a trout fishery, trout are not currently known to occur in the project area or further upstream. Fish species believed to be present are shiners, suckers, dace, and northern pikeminnow.

2.2 Alternatives

The National Environmental Policy Act (NEPA) and Corps of Engineers planning guidance (ER 1105-2-100) require the consideration of a reasonable range of alternatives during the planning process. The Corps and the University of Idaho identified a range of alternative concepts for this project. These alternatives were evaluated to determine if they were feasible from an

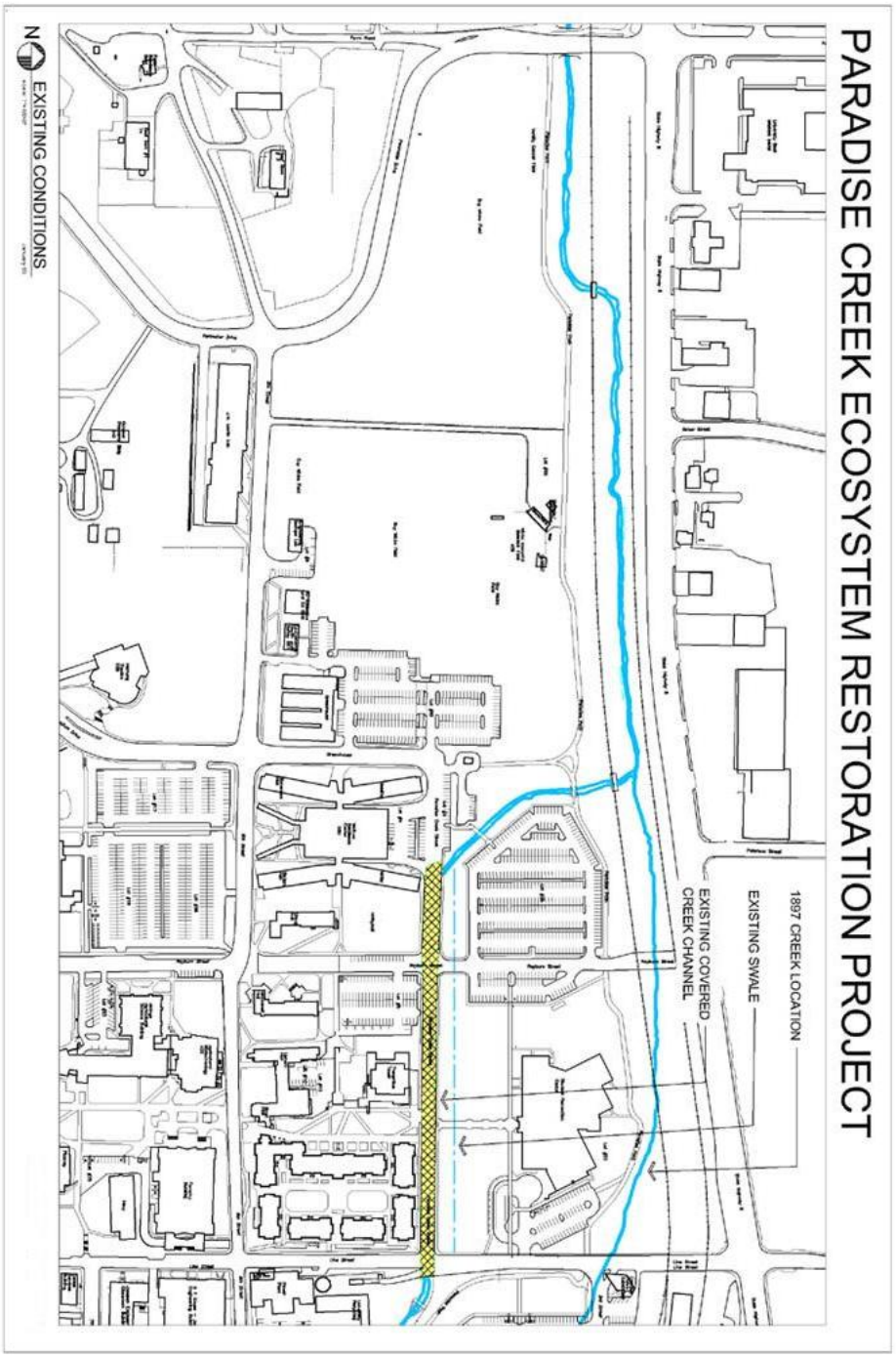
engineering, environmental, and economic standpoint, and that they were consistent with the project purpose. A "No Action" alternative is also considered and provides a baseline from which to compare the other alternatives.

The estimated future amount of revegetated area and aquatic habitat features have been used to establish the projected benefits for each of the proposed alternatives and options. Additionally, the predicted hydrologic and hydraulic conditions have been analyzed for the chosen alternative to ensure the flood carrying capacity for the one percent chance flood (100 year flood) has not been reduced and that erosion control features are appropriate.

2.2.1 Alternative 1 - No Action

With the No Action alternative, nothing would be done to change the condition of the creek. No ecosystem enhancements would be implemented. There would be no change in the environmental or social condition of the area due to the no action alternative. A sketch of this alternative is shown in Figure 2-1.

Figure 2-1. No Action Alternative/Existing Condition



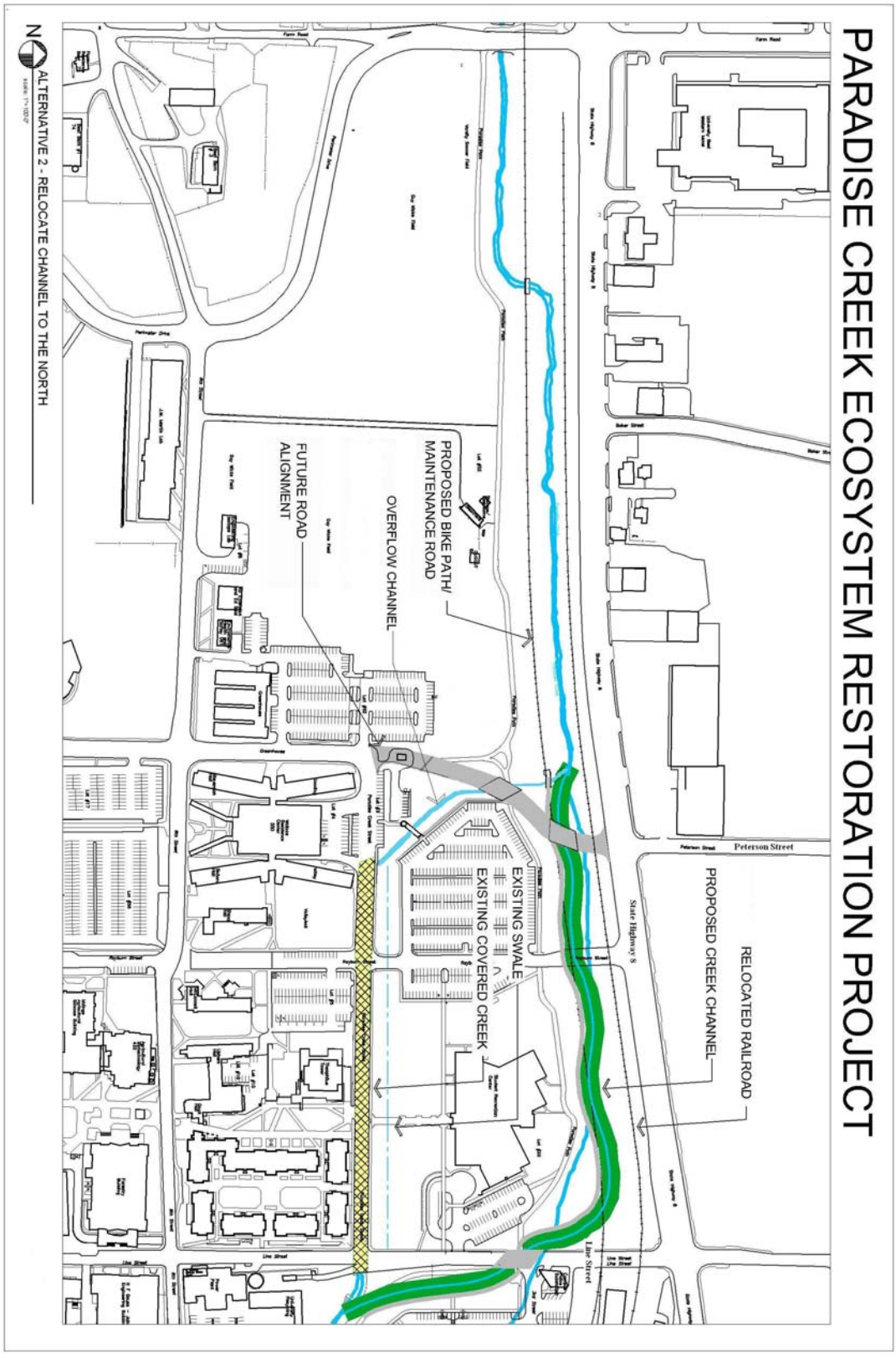
2.2.2 Alternative 2 – Relocate Channel to the North (part of the preferred alternative)

As a means to improve aquatic and riparian habitat features in the area, the covered section of Paradise Creek would be relocated, which would daylight the channel. This alternative would include two main elements: 1) Construct a diversion and high flow control structure at the existing debris trapping bar screen just upstream of Line Street, and 2) Construct about 2,000 feet of new channel routed north along the east side of Line Street to Third Street, crossing under Line Street, and then north and west adjacent to State Route 8, tying back into the existing channel. This land currently consists of open lawn grass, an active railroad line, and a railroad bed which was converted into a trail. The trail system would be moved along side the new channel alignment. The new channel and floodplain would be constructed as large as possible within the property constraints. High flows that cannot be contained within the new stream corridor would be routed into the existing covered channel.

This new alignment is close to the location where the creek was located over one hundred years ago. Sketches of the plan profile and cross section are shown in figures 2-2 and 2-3. This new channel segment would include gentle channel meanders and riparian vegetation, improving the habitat and aesthetics of the creek and enhancing its ability to provide water quality treatment. The existing overflow swale parallel to Paradise Creek Street would be filled with material from the new channel (see photo 2-2).

Hog Creek crosses State Route 8 at the intersection of Line Street. The creek is in a culvert under the street which turns west after it crosses beneath the highway and parallels the highway between the road and the railroad. The culvert discharges into Paradise Creek just west of the Recreation Center parking lot. Restoration of this portion of Hog Creek was evaluated as a part of this alternative, but it was determined that it would not be practical because of the numerous drain lines that tie into the culvert.

Figure 2-2. Alternative 2 - plan sketch

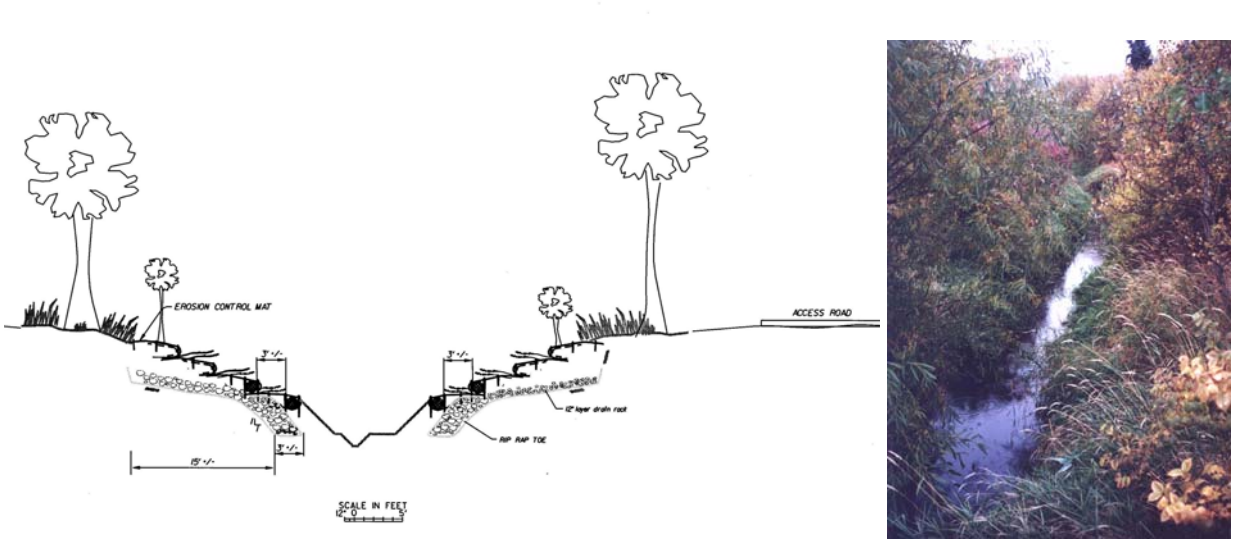


Following is a list of steps to be undertaken for this alternative. This list does not prescribe the exact sequence for all of the steps.

- Rayburn Street, north of the existing recreation center campus parking lot to the intersection with State Route 8, would be closed. It might later be totally removed by the University. The University plans to build a new street, including two stream crossings (one over the new channel and one over the overflow channel), at Peterson Street in the future. The abutments for the new bridges (or box culverts) at Peterson Street would be constructed at the same time as channel relocation work to minimize future disturbance to the riparian zone.
- Construction of a diversion structure at the existing debris trapping bar screen just upstream of Line Street.
- Construction of a pedestrian bridge just downstream of the diversion structure. This bridge would also function as a high flow control and protect utilities crossing in the area.
- Construction of a new traffic bridge/box culvert on Line Street just south of the intersection with 3rd Street.
- About 2,000 feet of new channel would be constructed, routed north along the east side of Line Street to Third Street, crossing under Line Street, and then heading north and west adjacent to State Route 8. The new channel would then tie into the existing Paradise Creek channel. The existing channel under Paradise Creek Street would remain in place as an overflow channel and to convey the existing storm water discharge.
- Several large trees, which need to be removed because they are in the new channel alignment, would be utilized as fish habitat structures in the new channel.
- The new channel would be stabilized with bioengineering materials and planted with native riparian plants and trees.
- Utilities would need to be relocated or modified. The new alignment would cross a city water line near the diversion structure and two sewer lines just west of Line Street.
- A 12-foot wide access and maintenance path would be placed at the edge of the riparian zone.

Photo 2-1. Active railroad within the proposed alignment of Paradise Creek. This rail line was recently relocated to the north (right side of the photo).

Figure 2-3. Alternative 2 – Typical cross section and example photo.



This alternative could have minor, short-term negative impacts on vegetation, aquatic resources, aesthetics, local transportation, air quality, noise, surface water quality, storm water quality, and public utilities. In the long term, no negative impacts are anticipated. Minor benefits would be realized for vegetation, wildlife, aquatic resources, wetlands, floodplains, aesthetics, land use, recreation, socio-economics, and water quality.

2.2.3 Alternative 3 – Reroute Channel into Existing Overflow Swale

The third alternative considered is to improve habitat along Paradise Creek by routing the low and normal flows of the creek into the overflow swale paralleling the existing covered channel. The new channel would connect back to the existing creek where the existing covered section daylights. A diversion structure would be necessary near the existing debris trapping bar screen. The trapezoidal swale would need to be reconfigured to accommodate a low flow channel and riparian vegetation. The cross sectional area of the swale would need to increase to account for the flow capacity lost due to the vegetation. The length of channel would increase slightly and the existing channel covered by Paradise Creek Street would remain in place to carry high flows and storm water discharge. Existing utilities and the railroad would not be impacted. The proposed alignment of this alternative is shown in Figure 2-4.

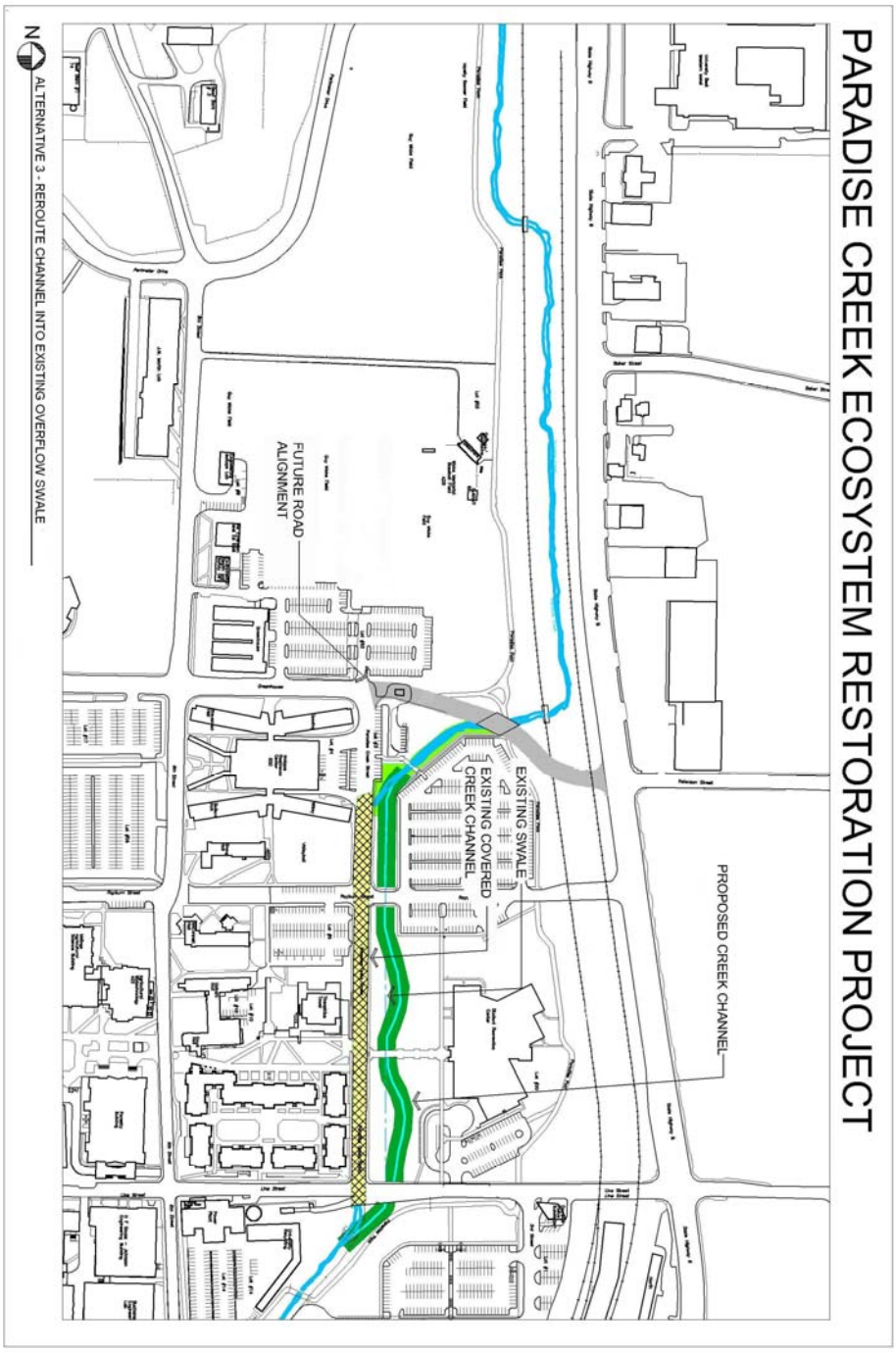
Photo 2-2. Overflow swale. Paradise Creek Street is on the left side of the photograph.

Following is a list of steps to be undertaken for this alternative. This list does not prescribe the exact sequence for all of the steps.

- Construction of a diversion structure at the existing debris trapping bar screen just upstream of Line Street.
- The Line Street Bridge would be modified to accommodate the low flow channel under the north side of the bridge.
- The inlet to the overflow channel would be lowered so that low flows are routed into the swale. The existing channel under Paradise Creek Street would remain in place as an overflow channel.
- The swale would be widened to account for lost flow capacity due to the increased vegetation, then stabilized with bioengineering materials, and planted with native riparian plants and trees.
- Consideration would be given to the University's plans for the future extension of Peterson Street, which would cross Paradise Creek.

This alternative could have minor, short-term negative impacts on aquatic resources, aesthetics, land use, recreation, local transportation, air quality, noise, surface water quality, and storm water quality. In the long term, there could be negative impacts on recreation because expansion of the University's student recreation center may be limited. Minor benefits would be realized for vegetation, wildlife, aquatic resources, wetlands, aesthetics, and water quality.

Figure 2-4. Alternative 3 plan sketch.



2.3 Options

The following optional elements could be included with the preferred alternative individually or together if they are deemed feasible and beneficial to the project. The potential options include construction of storm water wetland cells (Option 1), extension of the project further downstream on Paradise Creek (Option 2), and extension of the project further upstream on Paradise Creek (Option 3). Figure 2-5 depicts these options.

2.3.1 Option 1 – Storm Water Wetland Cells

Storm water wetland cells could be constructed near Paradise Creek to capture and treat some of the storm water runoff from part of the University campus. This could help improve the overall water quality of Paradise Creek. Typically the initial pulses of storm water are the most polluted. It would be these initial flows that would be targeted for retention and bio-treatment (performed by the vegetation) in the wetland cells.

Because of the amount of area available, two separate wetland cells approximately 0.2 acres each would be constructed. Wetland vegetation would be planted throughout the cells. The existing sanitary sewer lines and a water line would need to be relocated further north. Part of a parking lot would also be eliminated.

Impacts from this option would be included with impacts from alternative 2 or 3. This option could have minor, short-term negative impacts on aesthetics and noise. In the long term, no negative impacts are anticipated. Minor, benefits would be realized for vegetation, wildlife, aquatic resources, wetlands, aesthetics, and water quality.

2.3.2 Option 2 - Include Downstream Reach

This option differs from Alternative 2 or 3 by extending the restoration corridor further downstream on Paradise Creek. The University recently acquired much of this property. Channel improvements may not encroach closer than 25 feet to the railroad tracks. Environmental improvements would be made from the lower end of the selected alternative to Perimeter Drive. This option would increase the amount of environmental benefit by incorporating improvements to Paradise Creek downstream of the boundaries of the other alternatives. Photo 2-3 shows the channel just downstream from the proposed endpoint of Alternatives 2 and 3. This option would mainly involve channel reshaping, bioengineering stabilization methods, and revegetation with native riparian plants. The area proposed for this option is shown in Figure 2-5.

Recently it was determined that the real estate interest as it pertains to the railroad may not be sufficient to allow the Corps to invest in this option as originally designed. If appropriate real estate agreements can not be reached, only the lower third of this option, from Perimeter Drive upstream to the old railroad bridge would be constructed.

Following is a list of steps to be undertaken for this option. This list does not prescribe the exact sequence for all of the steps.

- Alternative 2 or 3 would be implemented.
- The downstream section of the channel would be reshaped, stabilized with bioengineering methods, and planted with native riparian vegetation.

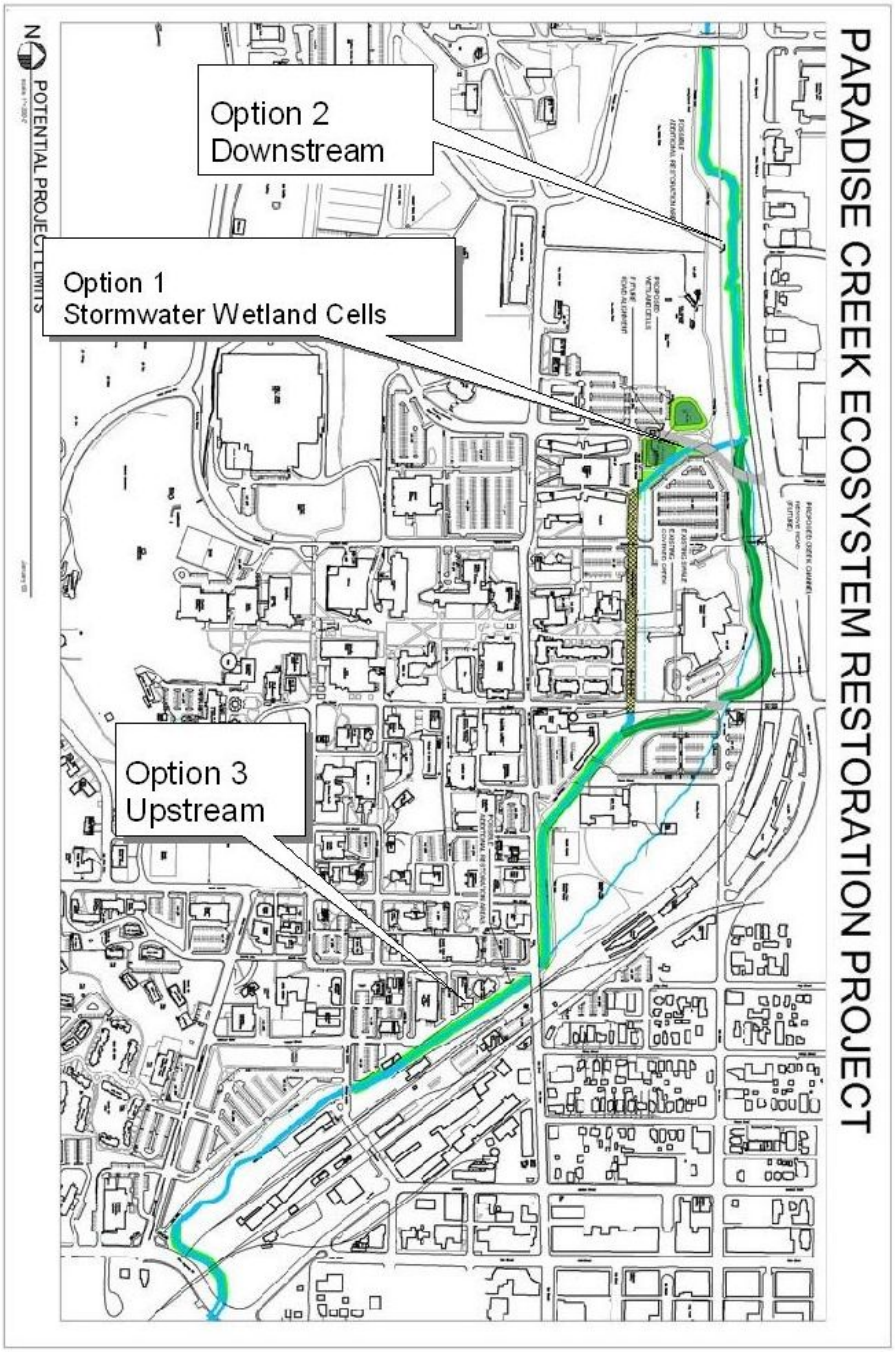
Impacts from this option would be included with impacts from alternative 2 or 3. This option could have minor, short-term negative impacts on aquatic resources, aesthetics, local transportation, noise, surface water quality, and storm water quality. In the long term, no negative impacts are anticipated. Minor benefits would be realized for vegetation, wildlife, aquatic resources, wetlands, aesthetics, land use, recreation, socio-economics, and water quality.

Photo 2-3. Channel downstream of alternative 2 or 3.

2.3.3 Option 3 – Include Upstream Reach

This option differs from Alternative 2 or 3 by extending the restoration corridor further upstream on Paradise Creek. This option could also be implemented in addition to alternative 2 or 3. Environmental improvements would be made from the upper limits of the selected alternative to Highway 95. This option would maximize the amount of environmental benefit by incorporating improvements to Paradise Creek upstream of the boundaries of the other alternatives. This option would mainly involve channel reshaping, bioengineering stabilization methods, and revegetation with native riparian plants. The area proposed for this option is shown in Figure 2-5.

Figure 2-5. Options - plan sketch. One, two, or all of these options could be combined with alternative 2 or 3.



Following is a list of steps to be undertaken for this option. This list does not prescribe the exact sequence for all of the steps.

- Alternative 2 or 3 would be implemented.
- The existing overhead electricity line along the creek would be relocated.
- Portions of the upstream section of channel would be reshaped where possible, stabilized with bioengineering methods, and planted with native riparian vegetation.

Impacts from this option would be included with impacts from alternative 2 or 3. This option could have short-term negative impacts on aquatic resources, aesthetics, local transportation, noise, surface water quality, storm water quality, and public services. In the long term, no negative impacts are anticipated. Benefits would be realized for vegetation, wildlife, aquatic resources, wetlands, aesthetics, land use, and water quality.

2.4 Preferred Alternative

The preferred alternative maximizes the environmental benefits that could be obtained. The preferred alternative is to combine alternative 2, relocating the creek channel further to the north with options 1, 2, and 3, storm water wetland cells and habitat improvements on downstream and upstream sections of the creek. Implementation of the options is dependent on funding and any real estate constraints that may arise. Funding priority will be given first to relocate the channel and make habitat improvements on the new channel.

The recommended plan consists of five principle components: excavation, shaping, and revegetating a new channel, constructing a diversion structure, reshaping and revegetating the existing channel in designated sections, constructing a vehicle bridge, and constructing a pedestrian bridge. The proposed alignment was designed to maximize environmental benefits.

For the proposed alignment, demolition and excavation would occur. Sections of Line Street and Rayburn Street would be demolished with the section of Line Street being replaced with a vehicle bridge or box culvert. Excavation would occur for the new channel alignment to include any elevated pavement or sidewalks within the area. Suitable excavation material from the new channel alignment would be used to fill in the existing flood overflow swale located along Paradise Creek Street. The remaining material from the demolition area as well as all non-suitable fill material (concrete, asphalt, etc) would be disposed of at the local Moscow landfill site or a selected alternative. Demolition and excavation would occur in the dry as much as possible to minimize the diversion of water.

The flow diversion structure would consist of 100 feet of concrete channel, with a bottom width of five feet and 2H:1V side slopes. The concrete would be 12 inches thick and reinforced. At the junction of the Paradise Creek Street overflow with the main (new) creek channel a concrete weir would be placed to control the amount of flow. This weir would be five feet high and the channel between the weir and the overflow would be concrete leading into the existing triple box culvert structure. Additionally the pedestrian bridge located just downstream of the diversion structure would have a concrete beam along the upstream end of the structure that extends three feet into the top of the channel to limit the amount of flow going into the new Paradise Creek. A

total of about 245 cubic yards of concrete would be used to construct the channel and the overflow weir.

The construction site would be isolated from the flowing water by routing the water around the site. The new channel would be created "in the dry" with water being routed into the new channel after the entire channel has been created. Elevated turbidity levels could be experienced for a short time after water is routed into the new channel. Measures such as silt fences would be used to limit water quality impacts due to resloping the streambanks in the upstream and downstream sections. Erosion control fabric and coir fiber logs would also be used to reduce bank erosion while vegetation becomes established. Willow cuttings, potted plants, and grass seed will be planted in the disturbed areas. Work would be conducted during the summer when flows would be low. The proposed project is not anticipated to have long-term negative effects on water quality.

Above grade excavation would be performed in the dry. For channel construction, flow would be maintained in the existing channel and therefore, a majority of the new channel construction would occur in the dry as well. During construction of the new channel, seepage and ground water may be encountered. Pumps should control this with discharge directed back into existing channel as much as possible. After the channel has been constructed (in the dry) to the fullest amount possible, the water barrier shall be breached and water would be directed into the new channel. At this time, the construction of the upstream diversion structure would be completed so that water flows in the new channel. The reshaping of the upstream and downstream existing creek sections and the wetland cells would occur in the dry as much as possible using coffer dams or other similar diversion structures to divert flow around construction areas.

2.5 Alternatives Removed from Further Consideration

We also considered an alternative that involved uncovering the existing channel and leaving it in its present location. This alternative was eliminated from further consideration because it would eliminate vehicle access to many of the buildings along Paradise Creek Street. Removing the street would be a safety hazard because emergency vehicles would not be able to get close to some of the residential apartment buildings. The alignment for this alternative is shown in Figure 2-6.

Figure 2-6. - Uncover existing channel, plan sketch.

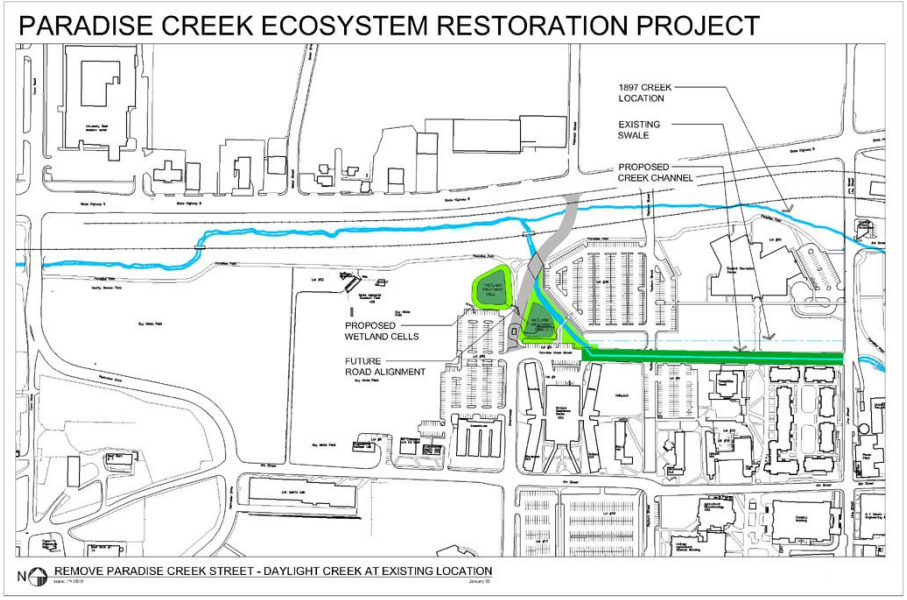


Table of Habitat Benefits

	Additional Acres of Habitat	Construction Cost	Cost per Acre
Alternative 1 - No Action	0	$0	$0
Alternative 2 – Reroute Channel to the North	3.2	$1,390,000	$434,375
Alternative 3 – Relocate Channel to Existing Swale	1.4	$630,000	$450,000
Option 1 – Construct Stormwater Wetland Cells	0.4	$482,000	$1,205,000
Option 2 – Include Downstream Reach	2	$1,241,000	$620,500
Option 3 – Include Upstream Reach	0.7	$432,000	$617,143

SECTION 3 - Affected Environment and Environmental Consequences

Alternatives that satisfy the project's purpose have been developed. This section discusses the existing environmental conditions of the project study area and the anticipated effects that would occur for each alternative and option over a wide range of environmental and social elements. In addition, the "No Action" alternative is evaluated which provides a comparison to the other alternatives. For the purposes of this environmental assessment, the project study area includes the corridor along Paradise Creek from Highway 95 to Perimeter Drive. The potential channel relocation area just south of State Route 8 is also included. The area that would undergo restoration varies by alternative. Operation and maintenance of the channel would not cause adverse effects to any of the environmental parameters being discussed.

Descriptions of the biological, physical, cultural, and socio-economic resources serve as a basis for evaluation and comparison of the anticipated effects of the alternatives, which are also presented. A summary table (Table 3-1) is included at the beginning of this section as a general overview of the relative magnitude of the short-term and long-term impacts from each alternative.

With the No Action alternative (Alternative 1), the existing channel and surrounding areas would not be modified. The stream would remain in its current condition. No ecosystem enhancements would be implemented. There would be no impacts (negative or positive) or changes to any of the parameters discussed later in this section.

3.1 Effects Summary Table

Table 3-1 summarizes the anticipated effects of the alternatives and options that are presented in detail later in the section. Subjective values were given to the anticipated effects on each parameter for each of the alternatives and options. Values from –2 to +2 were used to rank both short-term and long-term effects. Negative values depict negative impacts, 0 depicts no effect, and positive values represent benefits. The sum of all of the values for each parameter gives a general overall comparison of the alternatives. Alternative 3, put the new channel in the swale, would have the lowest overall benefit, while alternative 2 would have the most overall benefit. The options would add long-term benefits to the selected alternative.

Resource	**Alt 1 No Action**		**Alt 2 – Relocate Channel North**		**Alt 3 – Put Channel in Swale**		**Option 1 – Storm Water Cells**		**Option 2 – Include Downstream**		**Option 3 – Include Upstream**	
	S	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**
Vegetation	0	0	-1	2	0	1	1	1	0	2	0	1
Wildlife	0	0	0	1	0	1	0	1	0	2	0	1
Aquatic Resources	0	0	-1	2	-1	1	0	1	-1	2	-1	1
T&E Species	0	0	0	0	0	0	0	0	0	0	0	0
Wetlands	0	0	0	1	0	1	1	1	0	1	0	1
Floodplains	0	0	1	1	0	0	0	0	0	0	0	0
Aesthetics	0	0	-1	2	-1	1	-1	1	-1	2	-1	1
Land Use	0	0	2	2	-1	-1	0	0	1	1	1	1
Cultural Resources	0	0	0	0	0	0	0	0	0	0	0	0
Recreation	0	0	1	1	-1	-1	0	0	1	1	0	0
Socio-Economics	0	0	1	1	1	0	1	0	1	1	1	1
Transportation	0	0	-2	0	-1	0	0	0	-1	0	-1	0
HTRW	0	0	0	0	0	0	0	0	0	0	0	0
Air Quality	0	0	-1	0	-1	0	0	0	0	0	0	0
Noise	0	0	-1	0	-1	0	-1	0	-1	0	-1	0
Geology & Soils	0	0	0	0	0	0	0	0	0	0	0	0
Surface Water	0	0	-1	1	-1	1	1	1	-1	1	-1	1
Stormwater	0	0	-1	1	-1	1	1	2	-1	1	-1	0
Groundwater	0	0	0	0	0	0	0	0	0	0	0	0
Utilities/Public Services	0	0	-1	0	0	0	-1	0	0	0	-1	0
Sum	**0**	**0**	**-5**	**15**	**-8**	**5**	**2**	**8**	**-3**	**14**	**-5**	**8**
Overall	**0**		**10**		**-3**		**10**		**11**		**3**	

S=short-term impacts L=long-term impacts

3.2 Vegetation

Existing Conditions – Vegetation

Over the last 100+ years, dry-land farming has almost completely replaced the original upland vegetation in the area surrounding Moscow. Vegetation along the area's streams has also changed. The lower portion of Paradise Creek in the proposed project area is now dominated by non-native reed canary grass (photo 2-3). Reed canary grass can provide a tremendous amount of shade along a small stream, but it also can build up within the channel, retaining silt. This silt layer can greatly reduce the abundance of aquatic insects, which are used as food by fish.

A small number of trees are also located in this section. A well-mixed band of riparian vegetation exists in the section just below the covered section of Paradise Creek (see photo in figure 2-2). No vegetation exists along the creek through the covered section (photo 1-1 and 1-2). Vegetation upstream from the covered section varies, but is generally a thin band consisting of grasses and trees.

Environmental Consequences – Vegetation

Alternative 1 – No Action

Under the no action alternative, existing vegetation conditions would remain in the present highly degraded state throughout the proposed project area.

Alternative 2 – Relocate Channel to the North

Several large conifer trees would need to be removed to facilitate construction of the new channel. These trees would be used as in-stream fish habitat in the new channel. Native riparian vegetation would be planted along the new channel alignment. About 3.2 acres of riparian vegetation would replace the existing upland vegetation (mostly lawn grass).

Alternative 3 – Relocate Channel to the Existing Overflow Swale

If the low flow channel was moved into the overflow swale, approximately 1.4 acres of lawn grass would be replaced with riparian vegetation.

Option 1 – Construct Storm Water Wetland Cells

If this option were selected, about 0.4 acres of wetland and riparian vegetation could be created. The riparian vegetation would replace the existing lawn grass and parking lot. This would be in addition to the amount of riparian vegetation created by alternative 2 or 3. Existing trees along the channel would be avoided.

Option 2 – Include Downstream Reach

If this option were selected, about 2 acres of riparian vegetation would replace the existing riparian grasses. If the recently discovered real estate issues can not be resolved, about 0.7 acres of riparian habitat would be created. The cost associated with this option would also be greatly reduced. The amount of habitat created with this option would be in addition to the amount of riparian vegetation created by alternative 2 or 3. Existing trees along the channel would be avoided.

Option 3 – Include Upstream Reach

If this option were selected, about 0.7 acres of riparian vegetation would be created. This would be in addition to the amount of riparian vegetation created by alternative 2 or 3. Existing trees along the channel would be avoided where possible.

3.3 Wildlife

Existing Conditions – Wildlife

Wildlife resources in the general vicinity of the project area include upland birds, songbirds, waterfowl, raptors, small mammals, reptiles, amphibians, and a few fish species. Wildlife habitat along Paradise Creek is poor, especially within the city limits of Moscow. Recent beaver activity was noticed along Paradise Creek in the upstream option area. Fish are discussed in greater detail in the Aquatic Resources section.

Environmental Consequences – Wildlife

Alternative 1 – No Action

The no action alternative would not change the amount or distribution of wildlife in the proposed project area.

Alternative 2 – Relocate Channel to the North

Creating a new channel alignment would create over three acres of wildlife habitat where almost none exists now. Birds, fish, amphibians, and small mammals would likely utilize the area much more than the present condition. Construction of this alternative would have little if any effect on wildlife because very little wildlife habitat currently exists in the area.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

This alternative would increase the amount of wildlife habitat by more than one acre. There would likely be a small increase in the numbers of birds, fish, amphibians, and small mammals that use the area. Construction of this alternative would have little if any effect on wildlife because very little wildlife habitat currently exists in the area.

Option 1 – Construct Storm Water Wetland Cells

Increasing the amount of wetland in the area would further increase the amount of wildlife habitat in the area. Numbers of birds, amphibians, and small mammals using the area would likely increase slightly. Construction of this option would have little if any effect on wildlife because very little wildlife habitat currently exists in the area.

Option 2 – Include Downstream Reach

Extending the downstream boundary of the restoration project would further increase the amount of wildlife habitat in the area. Numbers of birds, fish, amphibians, and small mammals using the area would likely increase. Construction of this option could have a minor effect on wildlife. Some marginal quality wildlife habitat currently exists in the area.

Option 3 – Include Upstream Reach

Extending the upstream boundary of the project would also increase the amount of wildlife habitat in the area. Numbers of birds, fish, amphibians, and small mammals using the area would likely increase. Construction of this option could have a minor effect on wildlife. Some marginal quality wildlife habitat currently exists in the area.

3.4 Aquatic Resources

Existing conditions – Aquatic Resources

Fish species presently in Paradise Creek include suckers, shiners, dace, and northern pikeminnow. Trout were likely present historically. Low flows and poor water quality currently limit the creek's productivity.

Environmental Consequences – Aquatic Resources

Alternative 1 – No Action

The no action alternative would not impact or change the amount or distribution of aquatic resources in the proposed project area.

Alternative 2 – Relocate Channel to the North

Creating a new channel with this alternative would increase the amount and quality of habitat available to aquatic organisms. Construction of this alternative would have a negative effect on some small fish and other aquatic organisms when the water is diverted into the new channel and away from the existing channel.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

This alternative would increase the length of the channel slightly and improve aquatic habitat conditions. Construction of this alternative would have a negative effect on some small fish and other aquatic organisms when the water is diverted into the new channel and away from the existing channel.

Option 1 – Construct Storm Water Wetland Cells

Storm water wetlands would help improve water quality by removing some pollutants from the initial rainwater runoff. The improved water quality would benefit aquatic resources. There would be no impacts to aquatic organisms during construction.

Option 2 – Include Downstream Reach

Increasing the amount of stream where habitat improvements are made would increase the benefit to aquatic organisms. Among the various options considered, including downstream areas would provide the highest additional benefit to aquatic resources. Construction of this option would have only a minor negative effect on aquatic organisms. Water would remain in the channel during construction.

Option 3 – Include Upstream Reach

This option would provide a minor benefit to aquatic resources. The corridor for potential restoration efforts is very narrow. Construction of this option would have only a minor negative effect on aquatic organisms. Water would remain in the channel during construction.

3.5 Threatened and Endangered Species

Existing Conditions – Threatened and Endangered Species

The following species are listed for Latah County, Idaho (FES ref. # 2006-SL-0526 (June 1, 2006)) under the Endangered Species Act. However, none of these species are found in or near the proposed work area. Brief information on each of the species is presented.

Endangered: None

Threatened:

- Canada lynx (*Lynx canadensis*)
- Steelhead (*Oncorhynchus mykiss*)
- Spalding's catchfly (*Silene spaldingii*)
- Water howellia (*Howellia aquatilis*)
- Gray Wolf (*Canis lupus*)(experimental/non-essential)

Candidate: None

Canada lynx

Canada lynx were listed as threatened under the Endangered Species Act in March of 2000. Critical Habitat was proposed for designation in November 2005. The area around the proposed

project would not be included in the designation. Canada lynx would not be located near the highly developed project area. The proposed project would have no effect on Canada lynx.

Steelhead

Snake River steelhead were listed as threatened under the Endangered Species Act in August 1997. Critical Habitat was originally designated in March 2000, but was later vacated. It has since been redesignated. Paradise Creek flows into the Palouse River, which flows over Palouse Falls. Palouse Falls is a natural barrier to steelhead and other anadromous fish species. Paradise Creek is not designated as critical habitat. The proposed project would have no effect on steelhead.

Spalding's catchfly

Spalding's catchfly was listed as threatened under the Endangered Species Act in November 2001. Critical Habitat has not been designated. It is a plant in the carnation family. Plants range in height from 8 to 24 inches. Its distribution and habitat are limited. Spalding's catchfly is primarily restricted to native perennial grasslands. Most of the historic grasslands in the Northwest have been modified and are no longer suitable for this species. Known populations in Idaho occur in Idaho, Lewis, and Nez Perce counties. Although this plant is listed in Latah County, Idaho, no known populations exist there. The proposed project would have no effect on Spalding's catchfly.

Water howellia

Water howellia was listed as threatened under the Endangered Species Act in August 1994. Critical Habitat has not been designated. Water howellia is an aquatic plant that grows up to two feet in height. This plant historically occurred over a large area of the Pacific Northwest, but today it is only found in specific habitats in a few counties in each of the northwest states. In Idaho they are found only in Latah County. The one population in Idaho is located on private property.

Water howellia grows in firm consolidated clay and organic sediments that occur in wetlands associated with ephemeral glacial pothole ponds and areas that were once river oxbows. Microhabitats include shallow water and the edges of deep ponds that are partially surrounded by deciduous trees. It is most abundant in areas with little or no other aquatic vegetation, as it does not compete well with other plants. There is no known presence of water howellia near the proposed work area. The proposed project would have no effect on water howellia.

Gray wolf

Gray wolf was listed as experimental/non-essential under the Endangered Species Act in November 1994. Gray wolf would not be located near the highly developed project area. The proposed project would have no effect on gray wolf.

Environmental Consequences – Threatened and Endangered Species

None of the proposed alternatives or options would have any effect on ESA listed species.

3.6 Wetlands

Existing Conditions – Wetlands

Wetlands are defined by the presence of hydrophytic vegetation, hydric soils, and a regular hydrologic regime. Wetlands in the Paradise Creek watershed are typically associated with the riparian areas along the creek and its tributaries. Wetlands beside the creek are associated with the creek's water level, but also receive runoff from roads and fields. Natural vegetation is dominated by non-native reed canary grass, in addition to native sedges, willows, and alder.

Environmental Consequences – Wetlands

Alternative 1 – No Action

Wetlands would not be impacted by the no action alternative.

Alternative 2 – Relocate Channel to the North

No wetlands currently exist along the proposed new stream alignment. This alternative would not impact wetlands.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

Relocating the main channel to the existing overflow swale would not impact any wetlands.

Option 1 – Construct Storm Water Wetland Cells

The proposed stormwater wetland cells would not be constructed in or near existing wetlands. Small wetlands would be constructed under this option.

Option 2 – Include Downstream Reach

Including additional area downstream would create a small amount of additional wetland along the creek.

Option 3 – Include Upstream Reach

Including additional area upstream would create a small amount of additional wetland along the creek.

3.7 Floodplains

Existing Conditions – Floodplains

The historic floodplain through Moscow has been encroached on by developments such as roads, parking lots, and buildings. The channel has been modified in many locations. At Paradise Creek Street an enclosed channel and an overflow swale now convey the more frequent events, and only rare events (100 year) will encompass the entire floodplain. Flows up to the 100-year event are calculated to be contained within the channel and overflow swale with equal to or less than one foot rise in water surface if the remaining floodplain is further encroached upon. Downstream from Paradise Creek Street the channel is somewhat incised and confined by the adjacent railroad and highway, but some floodplain area exists.

Environmental Consequences – Floodplains

Alternative 1 – No Action

The no action alternative would not affect the floodplain in the proposed project area.

Alternative 2 – Relocate Channel to the North

Construction of the new creek segment may increase flood carrying capacity of the channel through this portion of the University and the community. The new channel would be constructed to include a floodplain. Flows higher than the new channel and floodplain can handle would be split between the new channel and the existing channel under Paradise Creek Street. Although the existing overflow swale may be filled in, the existing covered channel

would not be removed, therefore reducing the project cost and limiting the likelihood of flood impacts to surrounding property, building improvements, and utility infrastructure.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

The size of the existing overflow swale would be increased to maintain the existing flow capacity, while increasing the amount of vegetation along the channel. The swale would be reshaped to create a low flow channel and a floodplain within the cross section of the swale. There would be no net change in the amount of floodplain.

Option 1 – Construct Storm Water Wetland Cells

The wetland cells would be constructed outside of the floodplain. A small amount of stormwater runoff would be directed into the wetlands, but the quantity would be minor.

Option 2 – Include Downstream Reach

Some modifications to the stream banks in the downstream section of the proposed project could increase the amount of usable floodplain, especially during lower high-flow events (i.e. 4% to 20% exceedence flows).

Option 3 – Include Upstream Reach

Some modifications to the stream banks in the upstream section of the proposed project could increase the amount of usable floodplain slightly, especially during lower high-flow events (i.e. 4% to 20% exceedence flows).

3.8 Aesthetics

Existing Conditions – Aesthetics

The aesthetic quality of an area is a subjective factor to quantify. It is a measure of one's perception of how pleasing an area is. The main section of Paradise Creek being considered has been covered over, removing it from view. Currently the downstream portion of the proposed project area is basically an ignored area. Much of this reach is parallel to railroad tracks and a section of the Chipman Trail. The upstream section of the project area contains some trees and other vegetation, but is confined by roads and buildings through much of the reach.

Environmental Consequences – Aesthetics

Alternative 1 – No Action

Under the no action alternative, the aesthetic quality of the proposed project area would likely remain relatively similar to the existing condition.

Alternative 2 – Relocate Channel to the North

The section of Paradise Creek under Paradise Creek Street is currently hidden from view. Relocating the stream to the north into a more natural channel alignment and planting native riparian vegetation along the channel would make the creek visible to the public and increase vegetation in the area, improving the aesthetics of the area.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

Establishing a flowing channel in the overflow swale and planting the stream banks with native vegetation would increase the aesthetic value of the area. The linear character of the channel would look somewhat unnatural, but it would be an improvement over the existing condition because the creek would be visible to the public and include more vegetation.

Option 1 – Construct Storm Water Wetland Cells

Increasing the amount of wetland in the area would increase the aesthetic value of the area, especially if people are made aware of the importance and value of wetlands on cleaning surface water.

Option 2 – Include Downstream Reach
Increasing the amount of area where habitat improvements are performed would increase the aesthetic value of the area, especially in the downstream section of the proposed work area where very few trees currently exist.
Option 3 – Include Downstream Reach
Increasing the amount of area where habitat improvements are performed would increase the aesthetic value of the area.

3.9 Land Use/Land Ownership

Existing Conditions – Land Use/Land Ownership

The predominant land use within the watershed is private agricultural land. Typical crops include wheat, barley, peas, and lentils. The immediate area surrounding the proposed restoration project site is comprised of urban development.

The University now owns all of the land surrounding the proposed stream alignments and the location of the proposed storm water wetland cells. Costs associated with the real estate makeup part of the University's cost share portion for the project. The University of Idaho is currently working on the real estate details.

A railroad company owns land adjacent to the project. The University has an agreement with the railroad company to perform some work within the railroad's ownership boundary. It has not yet been determined if the existing agreement is sufficient for the Corp's real estate requirements.

Environmental Consequences – Land Use/Land Ownership

Alternative 1 – No Action
Existing land use and ownership of the proposed project area would remain in the existing condition under the no action alternative.
Alternative 2 – Relocate Channel to the North
The University of Idaho has acquired the land where this alternative would be constructed. The active railroad line has been relocated to the north rail bed, closer to State Route 8.
Alternative 3 – Relocate Channel to the Existing Overflow Swale
Land use would change only slightly with this alternative. The area of the swale would be increased to account for the lost channel capacity due to the increased amount of vegetation. The University of Idaho would maintain ownership of the land. This alternative could limit University's plans for expanding the student recreation center in the future.
Option 1 – Construct Storm Water Wetland Cells
The land where the wetland cells are proposed to be constructed is currently owned by the University of Idaho. The land is currently used as open space and a small part is used as a parking lot. This land use would change to wetland habitat if this option were implemented.
Option 2 – Include Downstream Reach
The University of Idaho has recently acquired some of the land adjacent to State Route 8. The railroad tracks were also recently relocated to the previously abandoned rail bed closer to the highway. The University and the railroad company have an agreement in place regarding working within the railroad right of way. It has yet to be determined if this agreement is sufficient of the Corp's real estate requirements. If it is determined to be insufficient, this option

may be reduced to work planned for the downstream third of the area. Overall use of the land would not change.

Option 3 – Include Upstream Reach

The University of Idaho recently acquired the land that would be used for this option. The railroad tracks have been moved further away from the creek. The area would be used for wildlife habitat and a recreation trail.

3.10 Cultural Resources

Existing Conditions – Cultural Resources

The Palouse Indians once occupied the Paradise Creek area. The first non-Indian settlement likely occurred during the 1860s. The University of Idaho was opened in 1892. The project area is located adjacent to a waterway where there is always the possibility of finding archeological artifacts. The project is located in areas where there has been previous disturbance of the stream channel and adjacent banks.

In September of 2003, cultural resources contractors performed an evaluation of the project's Area of Potential Effect (APE) that included surface surveys, test excavations, and historical research. There are 20 properties or districts nominated to the National Register of Historic Places in Moscow, Idaho. None are in proximity to the project's APE.

No cultural properties were observed in the APE during the surface survey or the sub-surface testing operation. The cultural resources contractor recommended that the project be constructed as planned. After review of the findings of the field evaluation, the Corps determined that the project would cause no effect to cultural properties and submitted the Agency's determination to the Idaho State Historical Preservation Office (SHPO) and the Nez Perce Tribe. The SHPO's concurrence with the agency's findings was received on November 24, 2003.

Environmental Consequences – Cultural Resources

None of the proposed alternatives or options would have any effect on cultural resources.

3.11 Recreation

Existing Conditions – Recreation

The main public recreation feature in the area of the proposed project is the Bill Chipman Palouse Trail (Chipman Trail), which was dedicated in 1998. The trail is part of the federal Rails to Trails program, which preserves railroad corridors for non-motorized transportation and possible future transportation use. A ten foot wide paved trail, accessible to people of all ages and abilities, extends over several miles of scenic Palouse country while crossing Paradise Creek multiple times. Three emergency phones, two handicap accessible restrooms, benches, bike racks and trash receptacles are all located along the trail. An interpretive signage program describes local human and natural history as well as agriculture and ecology topics.

Also located near the proposed project site is a student recreation facility available to University of Idaho students. The facility features two large gymnasiums, a multi-activity court with dasher boards, indoor running track, large cardiovascular and weight training areas, multi-activity rooms, classrooms, juice bar, and locker rooms. The focal point of the facility is a 55-foot-tall climbing pinnacle encased in a glass tower and visible throughout the community. In addition,

the university's outdoor recreation program is located in the facility. The University plans on expanding the recreation facility in the future.

Environmental Consequences - Recreation

Alternative 1 – No Action

Recreation in the Moscow area would remain unchanged if the no action alternative were selected.

Alternative 2 – Relocate Channel to the North

Impacts to recreation would be minor if this alternative were selected. Pedestrian and bicycle traffic on the Chipman Trail may need to be detoured a short distance during construction. The railroad track has recently been relocated and the Chipman Trail has been modified to account for the railroad changes. Additional modifications to the Chipman Trail would be constructed after the new channel is constructed. In addition, the existing overflow swale would be filled in, making additional room for future expansion of the student recreation center.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

If the existing overflow swale were used as the new channel it would need to be widened to account for an increased amount of vegetation. This could impact future expansion plans for the student recreation center. No other recreation impacts are anticipated.

Option 1 – Construct Storm Water Wetland Cells

The area being considered for the wetland cells is not currently used for any specific purpose. This option would not impact recreation.

Option 2 – Include Downstream Reach

Including downstream areas in the restoration would have no anticipated effect on recreation beyond the changes from the other selected alternative.

Option 3 – Include Upstream Reach

Including upstream areas in the project would have no anticipated effect on recreation beyond the changes from the other selected alternative.

3.12 Socio-Economics

Existing Conditions - Socio-Economics

The project is located within Latah County, Idaho or more specifically; the project is entirely within the city limits of Moscow, Idaho. The estimated population of Moscow is about 24,675. The median household income for Moscow is about $20,652[1]. The major economic influences providing the area's employment base are educational, health, and social services (54.1%); arts, entertainment, recreation, accommodation, and food services (13.4%); retail trade (7.6%); and professional services (5.8%).

Environmental Consequences - Socio-Economics

Alternative 1 – No Action

The no action alternative would not change the socio-economics of the Moscow area.

Alternative 2 – Relocate Channel to the North

Relocating the Paradise Creek channel to the north would be a minor economic benefit to the Moscow area. Temporary construction jobs, as well as procurement of fuel, supplies, and equipment would bring some money to the area. This alternative would also make future expansion of the student recreation center possible, which could benefit the Moscow economy.

[1] Data from U.S. Census Bureau web site http://factfinder.census.gov

Alternative 3 – Relocate Channel to the Existing Overflow Swale
Creating a channel within the existing overflow swale would be a minor economic benefit to the Moscow area. Temporary construction jobs, as well as procurement of fuel, supplies, and equipment would bring some money to the area.
Option 1 – Construct Storm Water Wetland Cells
Construction of storm water wetland cells would be a minor economic benefit to the Moscow area.
Option 2 – Include Downstream Reach
Including additional stream reaches downstream of the other alternatives would be a minor economic benefit to the Moscow area.
Option 3 – Include Upstream Reach
Including additional stream reaches upstream would be a minor economic benefit to the Moscow area.

3.13 Transportation

Existing Conditions –Transportation
Moscow is located at the intersection of U.S. Route 95 and Idaho State Route 8 in the Idaho panhandle. In Moscow there are also numerous roads and neighborhood streets. Near the proposed project area, there is currently only one signalized crosswalk (at Line Street) crossing State Route 8. This creates a dangerous situation for pedestrians trying to cross Route 8 further west. Rayburn Street is too close to the Line Street intersection to install another traffic control signal and crosswalk. The University plans on removing Rayburn Street and creating a new street opposite Peterson Street. This would allow installation of a traffic control signal and a crosswalk. An active railroad line runs adjacent to State Route 8. A train travels this route about once a week.

Environmental Consequences -Transportation
Alternative 1 – No Action
Transportation in the proposed project area would not change under the no action alternative. However, the University may continue plans to close and eliminate Rayburn Street and construct a new street further west of Rayburn Street (adjacent to Peterson Street).
Alternative 2 – Relocate Channel to the North
Creating a new channel that parallels State Route 8 would cause a negative short-term impact on transportation. Construction of a new bridge on Line Street would cause some traffic delays and may necessitate a temporary detour. The railroad tracks in the proposed project area were recently relocated about 100 feet further north.
Alternative 3 – Relocate Channel to the Existing Overflow Swale
This alternative would cause a negative short-term impact on transportation. Modification or replacement of the Line Street bridge could cause some traffic delays and may necessitate a temporary detour.
Option 1 – Construct Storm Water Wetland Cells
This option would have no effect on transportation.
Option 2 – Include Downstream Reach
This option would also not affect transportation.

Option 3 – Include Upstream Reach
This option could cause minor short-term traffic delays in the upstream stream reaches being considered due to the limited space available for access in some sections.

3.14 Hazardous, Toxic, and Radioactive Wastes (HTRW)

Existing Conditions – HTRW

Several HTRW sites are located near the proposed stream restoration area. The highest potential to discover HTRW materials exists near areas with underground storage tanks in close proximity to the work area. The primary impact of these tanks, if they leak, is to the shallow groundwater in the area, which is the primary recharge source for Paradise Creek (IDEQ 1997). Records indicate that there are 32 underground storage tanks within 1500 feet of the proposed restoration area, although many (24) of these are no longer used. Underground tanks in the area have leaked in the past, however, at the present time, no leaking underground storage tanks are known to exist near the proposed work area.

In most situations, releases of petroleum and hazardous materials must be reported. If any hazardous waste contamination is found during excavation, in the form of stained soil, free product, or unusual vapors, the Idaho Department of Environmental Quality, Lewiston Regional Office, (208-799-4370), would be contacted.

Environmental Consequences - HTRW

Alternative 1 – No Action
The no action alternative would not change the risk of HTRW findings in the Moscow area beyond the existing condition.
Alternative 2 – Relocate Channel to the North
The risk of contacting an HTRW site while excavating the proposed new channel is low. The nearest HTRW sites are located north of State Route 8.
Alternative 3 – Relocate Channel to the Existing Overflow Swale
The risk of discovering an HTRW site during construction is lowest with this alternative. Much of the area necessary for this alternative has previously been disturbed. Any contaminated sites would likely have been located at that time.
Option 1 – Construct Storm Water Wetland Cells
Because of the larger area included with this option, the risk associated with discovering HTRW contamination increase slightly, but is still very low.
Option 2 – Include Downstream Reach
Because of the larger area included with this option, the risk associated with discovering HTRW contamination increase slightly, but is still very low. All of the underground storage tanks adjacent to this reach are located near on the opposite side of State Route 8.
Option 3 – Include Upstream Reach
Because of the larger area included with this option, the risk associated with discovering HTRW contamination increase slightly, but is still low. Several underground storage tanks are located near Paradise Creek upstream of the proposed project.

3.15 Air Quality

Existing Conditions - Air Quality

The Clean Air Act of 1970, as amended, required the U.S. Environmental Protection Agency to adopt national ambient air quality standards for priority pollutants, which include sulfur dioxide, particulate matter, carbon monoxide, ozone, nitrogen dioxide, and lead. These standards are designed to protect human health and welfare. Areas in which the air pollutant levels exceed adopted standards for one or more pollutants are considered to be in "non-attainment." In those areas where pollutant levels do not exceed standards are considered to be in "attainment." Moscow is in an attainment area.

The proposed project must control fugitive dust during construction. Fugitive dust is particulate matter generated by natural or human activities that is suspended in the air by wind. Projects that require earthwork or otherwise have the potential to create fugitive dust are required to utilize best management practices to control dust. All reasonable precautions should be taken to prevent particulate matter from becoming airborne. Also, open burning of demolition or construction materials will not be permitted.

Environmental Consequences - Air Quality

Alternative 1 – No Action

The no action alternative would not impact air quality.

Alternative 2 – Relocate Channel to the North

Construction of this alternative would disturb several acres of ground, making it susceptible to the creation of fugitive dust. Dust control would be implemented to minimize air quality impacts. Emissions from construction equipment are not expected to have a noticeable effect on air quality.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

This alternative would also disturb several acres of ground during construction, making it susceptible to the creation of fugitive dust. Dust control would be implemented to minimize air quality impacts. Emissions from construction equipment are not expected to have a noticeable effect on air quality.

Option 1 – Construct Storm Water Wetland Cells

Implementation of this option would increase the amount of disturbed ground slightly. Dust abatement methods would minimize air quality impacts. Emissions from construction equipment are not expected to have a noticeable effect on air quality.

Option 2 – Include Downstream Reach

Implementation of this option would increase the amount of disturbed ground slightly. Dust abatement methods would minimize air quality impacts. Emissions from construction equipment are not expected to have a noticeable effect on air quality.

Option 3 – Include Upstream Reach

Implementation of this option would increase the amount of disturbed ground slightly. Dust abatement methods would minimize air quality impacts. Emissions from construction equipment are not expected to have a noticeable effect on air quality.

3.16 Noise

Existing Conditions – Noise

Noise levels within the City of Moscow are typical of those found in urbanized areas and vary by location and time of day. Noise levels in proximity to roadways likely range from 60 to 70 A-weighted decibels (dBA) along major roadways and are affected primarily by traffic volumes and speed. Residential noise levels are likely near 50 dBA and may be quieter during evening and nighttime hours.

Environmental Consequences - Noise

Alternative 1 – No Action

The no action alternative would not impact noise levels in the Moscow area.

Alternative 2 – Relocate Channel to the North

Construction of this alternative would cause a slight increase in noise levels while the work was being performed. Work would likely only take place during daylight hours. All of the work for this alternative is separated from residential areas.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

Construction of this alternative would also cause a slight increase in noise levels while the work was being performed. Work would likely only take place during daylight hours. Most of the work for this alternative is separated from residential areas.

Option 1 – Construct Storm Water Wetland Cells

Due to the increased area included in this option, increases in noise levels would be greatest for this option. The impact even from this option would be minor. There are no residential areas in close proximity to this proposed option.

Option 2 – Include Downstream Reach

The impact on noise levels from this option would be minor. There are no residential areas in close proximity to the stream in the downstream sections of this proposed alignment.

Option 3 – Include Upstream Reach

There are no residential areas in close proximity to the stream in the upstream sections of this proposed option. The impact from this option would be minor.

3.17 Geology and Soils

Existing Conditions – Geology and Soils

Columbia River basalt underlies the study area and is the most prominent rock formation in the Columbia Basin. The regionally widespread Columbia River basalt is the area's oldest geologic formation and is the bedrock of the region. The formation, ranging in total thickness to over 5,000 feet, is made up of numerous individual flows, commonly 25 to 100 feet thick, extending laterally for miles. Lake and stream deposits of clay, silt, sand, and gravel lie between the basalt flows. These sediments are known as the Latah Formation. Quaternary age deposits are found along the stream drainages and on the surface of the lower hills throughout the watershed. Paradise Creek's relatively young age, geologic setting, and fine-grained sediment suggest that the channel is prone to meander within a larger floodplain (IDEQ 1997). The Palouse hills are very susceptible to erosion due to their topography, soil texture, and general lack of vegetative cover.

Environmental Consequences – Geology and Soils

None of the proposed alternatives or options are expected to affect the geology or soils in the proposed project area.

3.18 Surface Water

Existing Conditions – Surface Water

The Clean Water Act, Section 303(d), provides a framework to identify streams that are water quality limited and, as a result, do not meet their designated beneficial uses. Beneficial uses for Paradise Creek in Idaho include cold water biota, secondary recreation, and agricultural water supply. The creek is currently not supporting its designated beneficial uses. Paradise Creek is listed on Idaho's 303(d) (1998) list for six pollutants: nutrients, sediment, thermal modification, flow modification, habitat modification, and pathogens. The 1996 303(d) list also included ammonia as a pollutant of Paradise Creek. In the winter and spring, suspended solids from eroding agricultural fields typically affect Paradise Creek during high runoff. During the low flows of the late summer, phosphorus and nitrogen are present in high enough concentrations to stimulate algal and macrophyte populations. Nutrient and bacterial levels often exceed both Idaho and Washington standards. Discharge from Moscow's sewage treatment plant and the University of Idaho's aquaculture facility enter Paradise Creek downstream from the proposed work area.

The proposed project must comply with the Paradise Creek Total Maximum Daily Load (TMDL) Implementation Plan in order to receive Section 401 Water Quality Certification from the Idaho Department of Environmental Quality. In addition, the proposed project meets the requirements of Nationwide Permit #27, Stream and Wetland Restoration Activities. However, since Paradise Creek is listed under section 303(d), a 401 Certification from Idaho Department of Environmental Quality is still required. As per the current guidelines for Stream Channel Alterations, a Stream Channel Alteration permit would not need to be obtained for the project because the project is authorized under section 404 of the Clean Water Act. However, the Corps will coordinate with the Idaho Department of Water Resources. The University may acquire the permit.

Environmental Consequences – Surface Water

Alternative 1 – No Action

The no action alternative would not impact surface water.

Alternative 2 – Relocate Channel to the North

Construction of the new creek segment would separate the main creek flow from a portion of the untreated campus runoff currently discharged directly into Paradise Creek. A small amount of in channel work would be needed where the new channel connects to the existing channel. Most of the new channel would be constructed prior to diverting water into it. There would likely be an elevated turbidity level when water is initially diverted into the new channel. Turbidity levels could also be elevated during construction of the high flow control structure just upstream of Line Street. Overall water quality in Paradise Creek would likely improve over time.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

This alternative would have similar effects on surface water quality as alternative 2. Construction of the new creek segment would separate the main creek flow from a portion of the untreated campus runoff currently discharged directly into Paradise Creek. A small amount of in

channel work would be necessary to connect the new low flow channel with the existing channel. There would likely be an elevated turbidity level when water is initially diverted into the new channel. Overall water quality in Paradise Creek would likely improve over time.

Option 1 – Construct Storm Water Wetland Cells

Construction of the wetland cells would not impact water quality. Operation of the wetland cells could improve water quality, especially following minor rain events. The wetland cells would mainly treat the initial pulse of storm water that runs off the surrounding land.

Option 2 – Include Downstream Reach

Including additional areas downstream could have a minor negative impact to water quality during construction. Measures such as silt fences would be used to reduce negative impacts while the streambanks are being resloped. The overall water quality conditions would improve over time.

Option 3 – Include Upstream Reach

Including additional areas downstream could have a minor negative impact to water quality during construction. Measures such as silt fences would be used to reduce negative impacts while the streambanks are being resloped. The overall water quality conditions would improve over time.

3.19 Storm Water Collection and Management

Existing Conditions – Storm Water

Within the covered portion of the channel, approximately 20 storm water collection pipes discharge directly into the creek carrying untreated runoff and spring water from about 126 acres of the University of Idaho campus. Also, just north of Paradise Creek Street, the University has constructed a 40-foot wide swale to carry flood flows. A Storm Water Pollution Prevention Plan will be developed for the project and coordinated with the EPA.

Environmental Consequences – Storm Water

Alternative 1 – No Action

The no action alternative would have no impact on storm water collection or management.

Alternative 2 – Relocate Channel to the North

Construction of the new creek segment would separate the main creek flow from some of the untreated campus runoff currently discharged directly into Paradise Creek. However, without diversion, this runoff would eventually flow back into the creek.

Alternative 3 – Relocate Channel to the Existing Overflow Swale

Rerouting the low flow of Paradise Creek into the overflow swale would also separate a portion of the untreated campus storm water runoff. This runoff water would likely flow into and mix with the creek just downstream of the swale.

Option 1 – Construct Storm Water Wetland Cells

The storm water wetland cells would be designed to capture the initial pulse of storm water for bio-treatment within the cells. This could improve the water quality conditions within Paradise Creek.

Option 2 – Include Downstream Reach

Including downstream sections of the channel into the restoration project would not have very much impact on storm water collection or management. A small benefit over time could be realized due to the expanded vegetative buffer, which could filter storm water prior to its reaching the creek.

Option 3 – Include Upstream Reach
Including upstream sections of the channel into the restoration project would not have very much impact on storm water collection or management. A small benefit over time could be realized due to the expanded vegetative buffer, which could filter storm water prior to its reaching the creek.

3.20 Groundwater

Existing Conditions – Groundwater

The size of the groundwater aquifer in the area is unknown. It is believed to flow westward towards the Snake River. People in Moscow rely almost entirely on groundwater for their municipal, university, and domestic water supply. Several springs also exist in the area.

Environmental Consequences - Groundwater

The groundwater level in Moscow is not expected to be affected by any of the proposed alternatives or options.

3.21 Public Services and Utilities

Existing Conditions – Public Services and Utilities

The City of Moscow obtains its potable water from groundwater wells. There are water lines near the proposed project area. The city also owns sewer lines, sections of which may need to be relocated because of some of the alternatives. Natural gas and electricity are supplied by Avista Utilities. Verizon provides telephone service. Television and internet cable service is provided by Adelphia. A complete survey of utilities in the area would be conducted prior to construction.

Environmental Consequences – Public Services and Utilities

Alternative 1 – No Action
The no action alternative would not impact public services or utilities.
Alternative 2 – Relocate Channel to the North
Relocating the channel would necessitate the relocation or modification of several utilities. Relocation of these utilities would be conducted in a manner to avoid or minimize any interruptions in service to customers.
Alternative 3 – Relocate Channel to the Existing Overflow Swale
If the low flow channel were routed into the overflow swale, few if any public utilities would need to be modified.
Option 1 – Construct Storm Water Wetland Cells
The sewer lines, a water line, and a communication line would need to be relocated because of construction of the wetland cells. Relocation of these utilities would be conducted in a manner to avoid or minimize any interruptions in service to customers.
Option 2 – Include Downstream Reach
Ground disturbance associated with this option would be limited to a corridor along the creek channel. Few if any public utilities or services would be impacted.
Option 3 – Include Upstream Reach
Ground disturbance associated with this option would be limited to a corridor along the creek channel. An overhead electric line would need to be relocated.

3.22 Cumulative Effects

Cumulative effects are the effects to an area or resource that result from the incremental impact of a proposed project when added to other past, present, and future projects or actions, regardless of what agency or individual performs the action.

Past urban development and channel modifications have had negative effects on Paradise Creek. In addition, changes throughout the watershed such as agriculture, road building, and timber harvest have impacted Paradise Creek. Water quantity and quality, as well as habitat quality have been degraded. The present regulatory controls and a heightened environmental awareness have likely helped to limit some of the negative effects to the creek. Increased urban development in the future has the potential to put increased pressure on the environmental conditions of Paradise Creek.

Environmental improvements in some sections of Paradise Creek have already taken place and more will likely be conducted in the future. This proposed project would enhance those restoration efforts. There are no known plans that would adversely affect this proposed project. All agencies and stakeholder groups that have been contacted to date have been very supportive of the proposed restoration project.

SECTION 4 – Environmental Laws, Regulations, and Policies

Section 4 identifies the legal, policy, and regulatory requirements that could affect each of the proposed alternatives. The implications for each of the requirements are discussed with respect to the proposed project. Summaries of compliance and coordination activities for each of the laws, policies, or regulation are provided.

4.1 National Environmental Policy Act (NEPA)

As required by the National Environmental Policy Act of 1969 and subsequent implementing regulations promulgated by the Council on Environmental Quality, this Environmental Assessment was prepared in order to determine whether the proposed action constitutes a "…major Federal action significantly affecting the quality of the human environment…" and whether an environmental impact statement is required. This assessment documents the evaluation and consideration of environmental effects throughout the study and planning process for the restoration and enhancement of Paradise Creek. A public information/scoping meeting was held on February 5, 2003 at the Moscow City Hall. Based upon the project purpose and objectives, and input from the public, alternative concepts for habitat enhancements were developed and evaluated. No significant issues that would require an environmental impact statement have been discovered to date. Review of public comments will determine if a "Finding of No Significant Impact" is applicable.

4.2 Clean Water Act

The Clean Water Act sets national goals and policies to eliminate discharge of water pollutants, regulate discharge of toxic pollutants, and prohibit discharge of pollutants from point sources without permits. The Clean Water Act also authorizes the Environmental Protection Agency to establish water quality criteria that are used by States to establish specific water quality standards.

Pursuant to Section 401 of the Clean Water Act, a Water Quality Certification for the recommended action has been requested from the Idaho Department of Environmental Quality. In order to receive a 401 certification for this project, the project must comply with the Paradise Creek TMDL Implementation Plan developed and managed by the Paradise Creek Watershed Advisory Group. Measures would be taken to protect surface water from stockpiled materials or demolition materials. Equipment would not be fueled nor fluids changed or stored within 100 feet of any waterway or wetland sites. If any hazardous waste contamination were found during excavation, in the form of stained soil, free product, or unusual vapors, the Lewiston Regional Office of the Idaho Department of Environmental Quality would be contacted immediately (208-799-4370).

Actions involving the discharge of dredged or fill materials into the waters of the United States would be in accordance with guidelines promulgated by the Environmental Protection Agency in conjunction with the Secretary of the Army under the authority of Section 404(b)(1) of the Clean Water Act. A Section 404(b)(1) Evaluation is not required for the project because the proposal meets the requirements of Nationwide Permit #27, Stream and Wetland Restoration Activities. The main impacts to water quality (mainly increased turbidity) would occur during installation of the flow control structure just upstream from Line Street. Work would be conducted during the

summer when flows would be low. The proposed project is not anticipated to have long-term negative effects on water quality.

Because the proposed project would disturb more than one acre of land, the Corps will coordinate with the EPA pursuant to Section 402 of the Clean Water Act. A Storm Water Pollution Prevention Plan will be prepared and used to minimize potential storm water impacts during construction.

Coordination with the Idaho Department of Water Resources will be conducted to insure compliance with Idaho's Rules Governing Stream Channel Alteration. The current rules indicate that a Stream Channel Alteration Permit would not be required since the project is authorized under Section 404.

4.3 Clean Air Act

The Clean Air Act of 1970 established a comprehensive program for improving and maintaining air quality throughout the United States. The goals of the Clean Air Act are achieved through permitting of stationary sources, controlling the emission of toxic substances from stationary and mobile sources, and establishing National Ambient Air Quality Standards. The act required the U.S. Environmental Protection Agency to adopt national ambient air quality standards for priority pollutants, which include sulfur dioxide, particulate matter, carbon monoxide, ozone, nitrogen dioxide, and lead. These standards are designed to protect human health and welfare. Areas in which the air pollutant levels exceed adopted standards for one or more pollutants are considered to be in "non-attainment." In those areas where pollutant levels do not exceed standards are considered to be in "attainment."

The Moscow area is considered to be in attainment for priority pollutants, including particulate matter. Construction activities have the potential to generate fugitive dust emissions. However, with the implementation of construction best management practices, activities associated with the alternatives are not anticipated to adversely affect air quality. Fugitive dust generated by the project must meet the rules for Control of Air Pollution in Idaho IDAPA (Idaho Administrative Procedure Act) 58.01.01.650. All demolition material must be disposed of in a non-municipal solid waste facility. Open burning of demolition or construction materials is prohibited by IDAPA 58.01.01.600.

4.4 Endangered Species Act

Section 7 of the Endangered Species Act states each Federal agency shall, in consultation with and with assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. A Biological Assessment is not required for this project because we have determined that there would be no effect on any ESA listed species.

4.5 National Historic Preservation Act

The National Historic Preservation Act requires that Federal agencies evaluate the effects of Federal undertakings on historical, archaeological, and cultural resources, and that they consult

with the State Historic Preservation Office and other interested parties regarding adverse cultural resource impacts.

No cultural properties were observed in the project's area of potential effect during a 2003 surface survey which included sub-surface testing. After review of the findings of the field evaluation, the Corps of Engineers determined the project would cause no effect to cultural properties and submitted the Agency's determination to the Idaho State Historic Preservation Office (SHPO) and the Nez Perce Tribe's Cultural Resource Program. The SHPO concurred with the agency's findings on November 24, 2003 (Appendix B).

4.6 Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act addresses the discovery, identification, treatment, and repatriation of Native American and Native Hawaiian human remains and cultural items (associated funerary objects, unassociated funerary objects, sacred objects, and objects of cultural patrimony).

In the event of an inadvertent discovery during construction the project would be stopped and the appropriate parties would be contacted.

4.7 Fish and Wildlife Coordination Act

In accordance with the Fish and Wildlife Coordination Act, the Corps is required to consult with the U.S. Fish and Wildlife Service and the lead fish and wildlife agency in the state that the work is to be performed.

The Corps has coordinated with both the U.S. Fish and Wildlife Service and the Idaho Department of Fish and Game to get their input on how to maximize the environmental benefits of the project and also to minimize the environmental impacts of the project.

4.8 Migratory Bird Treaty Act

The Migratory Bird Treaty Act involves conservation and protection of migratory birds in accordance with treaties entered into between the United States and Mexico, Canada, Japan, and the former Union of Soviet Socialist Republics; must protect other wildlife, including threatened or endangered species; and must restore or develop adequate wildlife habitat. The migratory birds protected under this Act are specified in the respective treaties. In regulating these areas, the Secretary of the Interior is authorized to manage timber, range, agricultural crops, and other species of animals, and to enter into agreements with public and private entities.

Any activities near potential migratory bird nesting sites would be monitored for active nesting prior to disturbance. If active nests are found, work in that area would be delayed until the young birds leave the nest.

4.9 Watershed Protection and Flood Prevention Act

The purpose of the Watershed Protection and Flood Prevention Act is to protect watersheds from erosion, floodwater, and sediment damages. The Act provides assistance programs to local organizations for protection of watersheds including flood control.

The actions proposed in this project would not affect upstream watersheds and they preserve designed levels of flood protection provided by the Paradise Creek floodway.

4.10 EO 11988 Floodplain Management

This Executive Order outlines the responsibilities of Federal agencies in the role of floodplain management. Each agency shall evaluate the potential effects of actions on floodplains and should avoid undertaking actions that directly or indirectly induce development in the floodplain or adversely affect natural floodplain values.

Alternatives considered for this project would maintain designed levels of flood protection and would improve natural floodplain values in the long-term.

4.11 EO 11990 Protection of Wetlands

This order directs Federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands. Section 2 of this order states that, in furtherance of the National Environmental Policy Act of 1969, agencies shall avoid undertaking or assisting in new construction located in wetlands unless there is no practicable alternative. The proposed project includes methods to enhance wetlands areas.

4.12 State and Local Laws, Policies, and Regulations

Required state and local permits are obtained by the local sponsor. No State or local permits are known to be required. The University may obtain a Stream Channel Alteration Permit from the Idaho Department of Water Resources.

SECTION 5 - Public and Agency Involvement

This section presents the results of discussions with the agencies having responsibility for permitting of the project or managing the natural resources within the project area.

Agency Consultation and Coordination

Two public information meetings were conducted. A meeting for interested regulatory agencies, local governments, tribes, and special interest groups was held on January 31, 2003 at the University of Idaho. Representatives from the Nez Perce Tribe, the University of Idaho, the City of Moscow, and the Corps of Engineers were present.

A second meeting for agencies and the general public was held in Moscow on February 5, 2003 at the Moscow City Hall. Initial project proposals were presented and input from the public was sought. Approximately 35 people attended the meeting. The meeting summary has been included as Appendix C.

Coordination was conducted with the following agencies during the Feasibility Study and preparation of the Environmental Assessment:

Federal:
U.S. Fish and Wildlife Service
Nez Perce Tribe

State:
Idaho Department of Fish and Game
Idaho Department of Environmental Quality
Idaho State Historic Preservation Office
Idaho Department of Water Resources

Local:
City of Moscow
Palouse River/Coulee City Railroad
Palouse Basin Aquifer Watershed Advisory Committee
Palouse Clearwater Environmental Institute

SECTION 6 - References

Corps of Engineers. 1989. Reconnaissance Report: Palouse River Basin, Idaho and Washington. Walla Walla District. March.

Federal Emergency Management Agency. 2002. Flood Insurance Study, City of Moscow, Idaho, Latah County. Community No. 160090V000. April.

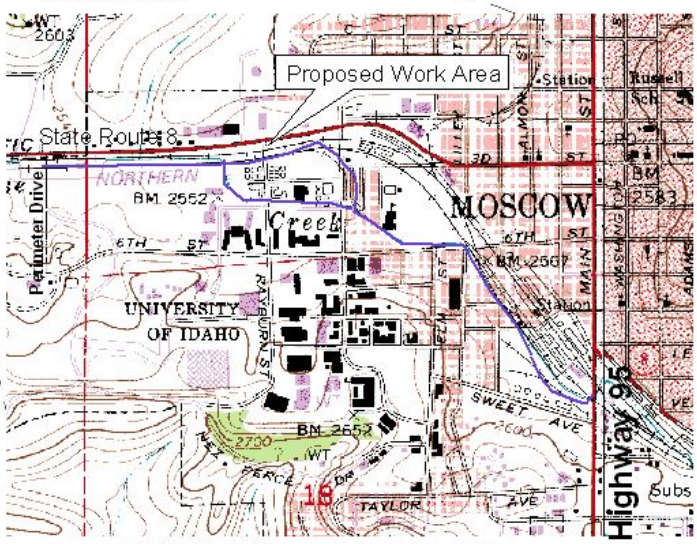
Idaho Division of Environmental Quality. 1997. Paradise Creek TMDL, Water Body Assessment and Total Maximum Daily Load. Idaho Division of Environmental Quality, Lewiston Regional Office. December.

U.S. Fish and Wildlife Service. 1989. Planning Aid Report: Palouse River Basin Reconnaissance Study, Idaho (in Corps 1989). March.

PROJECT VICINITY MAP

STATE OF IDAHO

CITY OF MOSCOW
LATAH COUNTY, IDAHO



Appendix A

Sponsor Letters

University of Idaho
FACILITIES
Architectural & Engineering Services
Capital Planning & Capital Budget
Facilities Maintenance & Operations

March 14, 2002

Army Corps of Engineers
Walla Walla District
201 N. 3rd Avenue
Walla Walla, WA 99362

Attn: LTC Richard P Wagenaar, USACE

Subjects: **LEAD AGENCY DESIGNATION and PROJECT SPONSORSHIP**
University of Idaho/City of Moscow application for determination of Federal Interest in regard to Paradise Creek Section 206 Improvements, Moscow, Idaho

Dear LTC Wagenaar:

Please accept this letter in regard to the joint application by the University of Idaho and City of Moscow for a determination of Federal Interest in regard to a proposed effort to improve a certain reach of Paradise Creek located in Moscow, Idaho as a Section 206 project.

When we last met, the Corps requested that the partners, University of Idaho and City of Moscow, determine a "lead agency" for the purposes of the application.

University and City staff have discussed the issue and made a recommendation to their respective leadership teams that the university assume the lead role. The recommendation is now accepted by both university and city leadership. Therefore the university will sponsor this project effort.

The university has begun the drafting of a preliminary memorandum of understanding to be held between the university and the city, verifying the commitments of both parties to the process and project. We anticipate completing that memorandum of understanding in the very near future.

Further, the university has nominated Andrew Conkey, UI Architectural and Engineering Services, to serve as project manager and point of contact. Andrew is a Registered Landscape Architect in the State of Idaho, has 6 years experience with the university and was heavily involved in the restoration of a reach of Paradise Creek from Highway 95 to College Avenue on the eastern edge of campus. Andrew has begun collecting the background information you requested in support of the application for determination of Federal interest.

Architectural & Engineering Services
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Moscow, Idaho 83844-2281
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Capital Planning & Capital Budget
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Moscow, Idaho 83844-3146
(208) 885-7044 FAX: (208) 885-9212

Facilities Maintenance & Operations
P.O. Box 442281
Moscow, Idaho 83844-2281
(208) 885-6246 FAX: (208) 885-5748

Andrew may be reached at:

Andrew Conkey
Project Landscape Architect
University of Idaho
Architectural & Engineering Services
875 West Perimeter Drive
Moscow, ID 83844-2281

Phone: (208) 885-7250
Fax: (208) 885-9333

andrewc@udiaho.edu

Please do not hesitate to contact Andrew if you have any questions or concerns.

Thank you very much for your efforts in regard to this project.

Sincerely,

RAYMOND FANKHF
FOR:

Joanne Reece
Assistant Vice-President
Facilities, University of Idaho

c: Greg Graham, USACE
David Dankel, USACE
Mark Cook, City of Moscow
Gerard Billington, University of Idaho
File
Chrono
AES Read

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LETTER OF UNDERSTANDING

in support of

ENVIRONMENTAL RESTORATION FEASIBILITY REQUEST

Habitat Restoration for a Specified Reach of Paradise Creek

City of Moscow and University of Idaho
Moscow, Idaho

WHEREAS

The City of Moscow, Idaho and the University of Idaho have made application to the U.S. Army Corps of Engineers, Walla Walla District to request that the Corps conduct a study under Section 206 of the Water Resources Development Act of 1996 for Aquatic Ecosystem Restoration to determine the federal interest in, and feasibility of, an environmental and habitat restoration project on a portion of Paradise Creek within the City of Moscow and on the campus of the University of Idaho. That portion of Paradise Creek to be included in this federal interest determination and feasibility study is a reach of Paradise Creek beginning at the crossing of Paradise Creek under Sixth Street on the east, and extending downstream to the Washington/Idaho state line on the west.

WHEREAS

The intent of the project is to return a specified reach of Paradise Creek to a natural state for the benefit of the City, the university and the greater community of Moscow. The City and the university jointly desire to study the feasibility of realigning this reach of the creek to lands in the control of the City and the university, return the creek to a daylight, open flow condition, make habitat improvements including the introduction of meanders, and provide a natural riparian zone in alignment with the aesthetic characteristics of the community linear park system.

WHEREAS

The City and the university understand from the Army Corps of Engineers that the Corps will initiate a four-step process. Specifically:

- Determination of Federal Interest
- Feasibility Assessment
- Design
- Construction

FURTHER

The City and the university understand from the Army Corps of Engineers that the Corps does not require a commitment of fiscal resources until a decision is made to proceed with the second step, Feasibility Assessment, upon the successful completion of the first step, Determination of Federal Interest. And that, if it is determined that there is federal interest in the project, and if the City and the university jointly agree to pursue the project, the City and the university will be jointly responsible for cost sharing 35% of the total project costs, to include the feasibility study and assessment, design and construction costs. In addition, the City and the university will be responsible for providing lands, easements, rights of way, disposal lands and taking over operating and maintenance costs.

THE CITY and THE UNIVERSITY do THEREFORE

Understand and agree that they will jointly commit to the provision of non-fiscal resources in terms of staff personnel, staff time, materials, and administrative and overhead resources in support of the application to the Army Corps of Engineers for the purposes of completing the Determination of Federal Interest for this project under Section 206 of the Water Resources Development Act of 1996 for Aquatic Ecosystem Restoration.

For the purposes of the support of the application and request, the City and the university agree that the university will serve as the point of contact with the Army Corps of Engineers. The university will appoint Project Landscape Architect, Andrew Conkey, to serve as the project manager. The university and the City will provide to the Army Corps of Engineers requested information, background documents, reasonable access to staff and other resources as requested by the Army Corps of Engineers through Mr. Conkey. The university and Mr. Conkey will keep the City apprised as to the status of the application and effort via regularly scheduled status briefings and additional briefings and reports as necessary.

Upon conclusion of the Determination of Federal Interest, and if it is determined that there is sufficient interest to allow the project to move forward to the Feasibility Assessment phase, the City and the university will then jointly agree to either pursue the project or not. Should the City and the university agree in fact to pursue the Design and Construction implementation phases of the project, this Letter of Understanding shall be superceded by a more detailed joint Memorandum of Understanding that will define in greater detail the partners' fiscal and operational commitments to the project.

AGREED

Marshall Comstock
Mayor,
City of Moscow

Date: 6-5-02

Jerry N. Wallace
Vice President, Finance and Administration
University of Idaho

Date: 6/27/02

University of Idaho
FACILITIES
P.O. Box 442281
Moscow, Idaho 83844-2281

July 8, 2002

LTC Richard P. Wagenaar
Commander, Walla Walla District
U.S. Army Corps of Engineers
Walla Walla, Washington 99362-1876

Attn: Dave Dankel

Subject: **SECTION 206 PRP – PARADISE CREEK ENVIRONMENTAL RESTORATION**
North Campus District, University of Idaho, Moscow, Idaho,
83844; UIPN: CP020041

Dear LTC Wagenaar:

On April 22, 2002, we requested that the U.S. Army Corps of Engineers conduct a study under Section 206 of the Water Resources Development Act of 1996 to determine the feasibility of an environmental restoration project on Paradise Creek that flows through the University of Idaho campus. We have worked with your staff in developing the Preliminary Restoration Plan.

We understand that the estimated total project cost of the restoration effort is $3.11 million. We also understand that at the time the University of Idaho and the Corps jointly execute the Project Cooperation Agreement, we will be responsible for 35% of the estimated total project cost. It is our intention to fully utilize the value of lands, easements, relocations, and rights of way (LERRDs), as a portion of our cost share match. Any remaining cost share match will consist of in-kind-service and/or direct funding. We understand that we will be responsible for the operation and maintenance once the project is complete. Those costs are currently estimated to be $10,000 per year.

The University of Idaho and the City of Moscow, our partner in this project, are extremely interested in the prospects of restoring this stretch of Paradise Creek. There is a considerable amount of local support in both the University of Idaho and City of Moscow communities. In addition to restoring a natural riparian habitat, we believe this project will promote the public interest in environmental stewardship and the principles of sustainability. It will preserve open-space within the community and complement past and future similar restoration projects involving Paradise Creek as it runs through the region. We look forward to moving ahead to the feasibility phase after the Preliminary Restoration Plan is approved.

Sincerely,

Joanne Reece
Assistant Vice President

cc: Mark Cook, Director of Public Works, City of Moscow
Jerry Wallace, Vice President, Finance and Administration
Raymond Pankopf, Director, A&E Services
Laura Hubbard, Director, Capital Planning & Budget
Andrew Conkey, Project Manager

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Facilities Maintenance & Operations
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Appendix B

Idaho State Historic Preservation Office Concurrence Letter.

IDAHO STATE HISTORICAL SOCIETY

Our mission: to educate through the identification, preservation, and interpretation of Idaho's cultural heritage.

Dirk Kempthorne
Governor of Idaho

Steve Guerber
Executive Director

Administration
1109 Main Street, Suite 250
Boise, Idaho 83702-5642
Office: (208) 334-2682
Fax: (208) 334-2774

Archaeological Survey
210 Main Street
Boise, Idaho 83702-7264
Office: (208) 334-3847
Fax: (208) 334-2775

Capitol Education Center
Statehouse/P.O. Box 83720
Boise, Idaho 83720-0001
Office: (208) 334-5174

Historical Museum and Education Programs
610 North Julia Davis Drive
Boise, Idaho 83702-7695
Office: (208) 334-2120
Fax: (208) 334-4059

Historic Preservation Office
210 Main Street
Boise, Idaho 83702-7264
Office: (208) 334-3861
Fax: (208) 334-2775

Historic Sites Office
2445 Old Penitentiary Road
Boise, Idaho 83712-8254
Office: (208) 334-2844
Fax: (208) 334-3225

Library/Historical and Genealogical Collection
450 North Fourth Street
Boise, Idaho 83702-6027
Office: (208) 334-3356
Fax: (208) 334-3198

Oral History
450 North Fourth Street
Boise, Idaho 83702-6027
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Fax: (208) 334-3198

Memberships and Outreach and Development
1109 Main Street, Suite 250
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Fax: (208) 334-2774

Publications
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Boise, Idaho 83702-6027
Office: (208) 334-3428
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November 24, 2003

Mr. Peter Poolman
Walla Walla District
Corps of Engineers
201 North Third Ave.
Walla Walla, Washington 98362-1876

RE: Cultural Resources Survey of the Paradise Creek Ecosystem Restoration Project, Moscow, Idaho

Dear Mr. Poolman:

Thank you for sending the report documenting the archaeological survey of the Paradise Creek Ecosystem Restoration Project in Moscow, Idaho. The investigations, completed by Dr. Lee Sappington, meet the Secretary of the Interior's Standards.

After reviewing the report, we accept the findings that no historic properties were identified within the project area. We also support the Corps' recommendation that ground disturbing activities associated with the project be monitored by a professional archaeologist. With this proviso, the project will have no effect on historic properties, and work can proceed as planned.

If archaeological remains are discovered during construction, your archaeological contractor and Corps Archaeologist Ray Tracy should be contacted immediately.

We appreciate your cooperation. If you have any questions or project plans change, please contact me at 208-334-3847.

Sincerely,

Susan Pengilly Neitzel
Deputy SHPO and
Compliance Coordinator

cc: Mr. Ray Tracy, Corps of Engineers

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Appendix C

Public Meeting Summary

Paradise Creek Aquatic Ecosystem Restoration Project
Public Information Meeting Summary

1. A public information meeting was held on February 5, 2003 in Moscow, Idaho with a total of 35 participants attending the open house and formal meeting with breakout sessions.

2. Meeting participants included University of Idaho faculty and students, City of Moscow staff, environmental organizations, congressional representatives, members of the Nez Perce Tribe, and local citizens.

3. Four objectives were established for the meeting:
   a. Present Paradise Creek Aquatic Ecosystem Restoration project to the public
   b. Create an opportunity for public questions/answers about the study
   c. Receive public input on concerns and issues relating to the study
   d. Provide public understanding of the Paradise Creek Restoration Project and Environmental Analysis process.

4. The meeting began with an open house where participants were able to view draft concepts about the potential restoration project and to discuss the project one-on-one with technical staff. The formal portion of the meeting began with a welcoming from Peg Hamlett, City of Moscow and an explanation of the University of Idaho's involvement and future plans by Ray Pankopf. Dave Dankel, Project Manager with the Corps of Engineers, gave a brief explanation of meeting objectives and discussed the study purpose, scope, schedule, and milestones. The University of Idaho's project manager Andrew Conkey presented five draft concepts to consider for restoration of Paradise Creek within the University's campus. Following the presentations the managers fielded questions from the audience. During the question and answer sessions participants had the opportunity to inquire or comment about the restoration project.

5. Breakout group sessions followed. The sessions allowed participants to identify and prioritize issues, concerns, and visions for the future restoration of Paradise Creek. Two questions were provided to the participants in a small group setting. All issues, concerns, and ideas that originated from the participants were listed on a flip chart for each question. Participants were then asked to select their most significant issues/concerns and future visions. The responses are listed by breakout group as identified by those in attendance.

GROUP 1

1. WHAT ARE YOUR CONCERNS OR ISSUES REGARDING THE PARADISE CREEK ECOSYSTEM RESTORATION PROJECT?

-Long term maintenance & monitoring
-Incorporate student work/research
-How does existing trail fit with project
-Maximize channel width & stream channel within → (minimize low-flow channel width)
-Use native plants w/high phosphorous absorption in both stream & wetlands.
-How to maintain flow in wetlands
-Concern about hydraulic capacity of swale
-Habitat improvement – needed
-Functional flood plain (wide as possible)
-Will construction impact creek flow?
-Make room for a path
-Protection of existing sanitation/sewer interceptors
-Make sure Peterson St. exit is accounted for/phased w/project (Bridge abutments, etc.)
-Daylighting Paradise Creek St. – too-close to new dorms.
-Longer creek channel is better for restoration
-Maximize meanders
-No lawn in channel area
-Shading of creek channel
-Monitor project benefits

2. WHAT IS YOUR VISION FOR THE FUTURE OF PARADISE CREEK?

-Research & education site
-Reduce Total Maximum Daily Load (TMDL for paradise creek)
-Shading of stream
-Enhance connections with existing riparian zones
-Bio-engineered stream revetments -natural stream appearance & functionality
-Enhance fish habitat – vary depth of creek
-Community involvement (volunteers)

GROUP 2

1. WHAT ARE YOUR CONCERNS OR ISSUES REGARDING THE PARADISE CREEK ECOSYSTEM RESTORATION PROJECT?

-Natural restoration is key. / Wildlife Habitat
-Maintain or improve recreation opportunity
-Native Vegetation
-Funding (cost shared)
-Flood Capacity
-Location near highway
-Weed control (Reed Canary Grass)

2. WHAT IS YOUR VISION FOR THE FUTURE OF PARADISE CREEK?

-Natural state = Key
-Public involvement (Environmental Volunteers)
-Native fish restoration
-Creek becomes focal point for community
-Is a pond/urban fishery possible?
-Connection between Moscow to Pullman projects?
-Public Info/Education
-Consider route - near 1897 location (Ghormley Park)

GROUP 3

1. WHAT ARE YOUR CONCERNS OR ISSUES REGARDING THE PARADISE CREEK ECOSYSTEM RESTORATION PROJECT?

-Lack of scientific input into the concept/design process.
-Concern with treatment efficiency of wetland cells, - with option (concept) #3.
-Prefer a true ecosystem project – that works but not just aesthetically but based on a proven scientific system.
-Safety issues, i.e. drowning, injury, etc.
-Equal partnership between university and city.
-Expanding project upstream to 6th & Deacon
-Need for University technical involvement in feasible alternative development.

2. WHAT IS YOUR VISION FOR THE FUTURE OF PARADISE CREEK?

-Complete/facilitate bike path "maintain" path.
-Improve water quality
-Native plantings; natural look; not manicured.
-Have students & faculty be involved in planning process, design (also construction & monitoring)
-Incorporate into curriculum & training – multi-disciplines.
-Better aesthetics
-Include more upstream, incorporate historical alignment to maximum extent possible